Appendix C
Biological Resources

Site Photographs

Habitats Associated with Alternatives MEN-5 or MEN-7

East bank of San Joaquin River, south to east panoramic view from abutment of existing Mendota Dam, September 16, 2005.

Riparian zone along east side of San Joaquin River, view south from northern end of proposed temporary spillway, September 16, 2005.

San Joaquin River and riparian/upland habitat that would be inundated by pool extension, view west, September 16, 2005.

Ruderal habitat west of Mendota Pool, view southeast, September 16, 2005.

Riparian zone east of existing Mendota Dam, view northwest, September 16, 2005.

Habitats Associated with Alternatives MEN-9B or MEN-12

South side of the proposed Rubber Dam Site, view east, October 19, 2005.

North side of the proposed Rubber Dam site, view northwest, October 19, 2005.

Rubber Dam crossing north side facing southwest, October 19, 2005.

Proposed jack & bore location west of San Luis Drain /Pump 7, Valley Sink Scrub habitat, October 19, 2005.

Pump Station 6-2 south side, view east, October 19, 2005.

Pump 7 construction area, representative photo of harvested winter wheat along alignment, October 19, 2005.

Mendota Wildlife Area Species List

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

December 15, 2005

Document Number: 051215084724

Craig Williams
CH2M HILL
2485 Natomas Park Drive, Suite 600
Sacramento, CA 95833-2937

Subject: Species List for Conveyance of Refuge Water Supply Environmental Assessment and Initial Study, Mendota Wildlife Area

Dear: Mr. Williams

We are sending this official species list in response to your December 15, 2005 request for information about endangered and threatened species. The list covers the California counties and/or U.S. Geological Survey 7½ minute quad or quads you requested. You have stated that this list is not for consultation with the Fish & Wildlife Service.

Our database was developed primarily to assist Federal agencies that are consulting with us. Therefore, our lists include all of the sensitive species that have been found in a certain area *and also ones that may be affected by projects in the area.* For example, a fish may be on the list for a quad if it lives somewhere downstream from that quad. Birds are included even if they only migrate through an area. In other words, we include all of the species we want people to consider when they do something that affects the environment.

Please read Important Information About Your Species List (below). It explains how we made the list and describes your responsibilities under the Endangered Species Act.

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed, candidate and special concern species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be March 15, 2006.

Please contact us if your project may affect endangered or threatened species or if you have any questions about the attached list or your responsibilities under the Endangered Species Act. A list of Endangered Species Program contacts can be found at www.fws.gov/sacramento/es/branches.htm.

Endangered Species Division

TAKE PRIDE IN AMERICA

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 051215084724
Database Last Updated: November 3, 2005

CRITICAL HABITAT:

On August 11, 2005, the Service published a revised critical habitat designation for vernal pool species. It did not specify critical habitat locations on a species by species basis. If there are species on the list(s) below that were covered under the rule, they are shown because we believe that they are present in the area or may be affected by projects in the area, not because it has specifically been designated as critical habitat for them.

Quad Lists

TRANQUILLITY (360A)

Listed Species

Invertebrates

Branchinecta lynchi - vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus - valley elderberry longhorn beetle (T)

Fish

Hypomesus transpacificus - delta smelt (T)

Oncorhynchus mykiss - Central Valley steelhead (T)

Amphibians

Rana aurora draytonii - California red-legged frog (T)

Reptiles

Gambelia (=Crotaphytus) sila - blunt-nosed leopard lizard (E)

Thamnophis gigas - giant garter snake (T)

Birds

Haliaeetus leucocephalus - bald eagle (T)

Mammals

Dipodomys nitratoides exilis - Critical habitat, Fresno kangaroo rat (X)

Dipodomys nitratoides exilis - Fresno kangaroo rat (E)

Vulpes macrotis mutica - San Joaquin kit fox (E)

Plants

Cordylanthus palmatus - palmate-bracted bird's-beak (E)

Species of Concern

Invertebrates

Branchinecta mesovallensis - Midvalley fairy shrimp (SC)

Linderiella occidentalis - California linderiella fairy shrimp (SC)

Lytta molesta - molestan blister beetle (SC)

Fish

Pogonichthys macrolepidotus - Sacramento splittail (SC)
Spirinchus thaleichthys - longfin smelt (SC)

Amphibians

Spea hammondii (was Scaphiopus h.) - western spadefoot toad (SC)

Reptiles

Clemmys marmorata marmorata - northwestern pond turtle (SC)
Clemmys marmorata pallida - southwestern pond turtle (SC)
Masticophis flagellum ruddocki - San Joaquin coachwhip (=whipsnake) (SC)
Phrynosoma coronatum frontale - California horned lizard (SC)

Birds

Agelaius tricolor - tricolored blackbird (SC)
Athene cunicularia hypugaea - western burrowing owl (SC)
Branta canadensis leucopareia - Aleutian Canada goose (D)
Buteo regalis - ferruginous hawk (SC)
Buteo Swainsoni - Swainson's hawk (CA)
Calypte costae - Costa's hummingbird (SC)
Carduelis lawrencei - Lawrence's goldfinch (SC)
Chaetura vauxi - Vaux's swift (SC)
Charadrius montanus - mountain plover (SC)
Elanus leucurus - white-tailed (=black shouldered) kite (SC)
Empidonax traillii brewsteri - little willow flycatcher (CA)
Falco peregrinus anatum - American peregrine falcon (D)
Grus canadensis tabida - greater sandhill crane (CA)
Lanius ludovicianus - loggerhead shrike (SC)
Melanerpes lewis - Lewis' woodpecker (SC)
Numenius americanus - long-billed curlew (SC)
Picoides nuttallii - Nuttall's woodpecker (SLC)
Plegadis chihi - white-faced ibis (SC)
Selasphorus rufus - rufous hummingbird (SC)

Mammals

Ammospermophilus nelsoni - San Joaquin (=Nelson's) antelope squirrel (CA)
Corynorhinus (=Plecotus) townsendii townsendii - Pacific western big-eared bat (SC)
Dipodomys nitratoides brevinasus - short-nosed kangaroo rat (SC)
Eumops perotis californicus - greater western mastiff-bat (SC)
Myotis ciliolabrum - small-footed myotis bat (SC)
Myotis volans - long-legged myotis bat (SC)
Myotis yumanensis - Yuma myotis bat (SC)
Perognathus inornatus - San Joaquin pocket mouse (SC)

Plants

Atriplex cordulata - heartscale (SC)

Atriplex depressa - brittlescale (SC)
Eriastrum hooveri - Hoover's eriastrum (= woolly-star) (D)
Layia munzii - Munz's tidy-tips (SC)

COIT RANCH (360B)

Listed Species

Invertebrates

Branchinecta lynchi - vernal pool fairy shrimp (T)
Desmocerus californicus dimorphus - valley elderberry longhorn beetle (T)

Fish

Hypomesus transpacificus - delta smelt (T)

Amphibians

Rana aurora draytonii - California red-legged frog (T)

Reptiles

Gambelia (=Crotaphytus) sila - blunt-nosed leopard lizard (E)
Thamnophis gigas - giant garter snake (T)

Birds

Haliaeetus leucocephalus - bald eagle (T)

Mammals

Dipodomys ingens - giant kangaroo rat (E)
Dipodomys nitratoides exilis - Fresno kangaroo rat (E)
Vulpes macrotis mutica - San Joaquin kit fox (E)

Species of Concern

Invertebrates

Branchinecta mesovallensis - Midvalley fairy shrimp (SC)
Linderiella occidentalis - California linderiella fairy shrimp (SC)
Lytta molesta - molestan blister beetle (SC)

Fish

Pogonichthys macrolepidotus - Sacramento splittail (SC)
Spirinchus thaleichthys - longfin smelt (SC)

Amphibians

Spea hammondii (was Scaphiopus h.) - western spadefoot toad (SC)

Reptiles

Anniella pulchra pulchra - silvery legless lizard (SC)
Clemmys marmorata marmorata - northwestern pond turtle (SC)

Clemmys marmorata pallida - southwestern pond turtle (SC)
Masticophis flagellum ruddocki - San Joaquin coachwhip (=whipsnake) (SC)
Phrynosoma coronatum frontale - California horned lizard (SC)

Birds

Agelaius tricolor - tricolored blackbird (SC)
Athene cunicularia hypugaea - western burrowing owl (SC)
Branta canadensis leucopareia - Aleutian Canada goose (D)
Buteo regalis - ferruginous hawk (SC)
Buteo Swainsoni - Swainson's hawk (CA)
Calypte costae - Costa's hummingbird (SC)
Carduelis lawrencei - Lawrence's goldfinch (SC)
Chaetura vauxi - Vaux's swift (SC)
Charadrius montanus - mountain plover (SC)
Elanus leucurus - white-tailed (=black shouldered) kite (SC)
Empidonax traillii brewsteri - little willow flycatcher (CA)
Falco peregrinus anatum - American peregrine falcon (D)
Grus canadensis tabida - greater sandhill crane (CA)
Lanius ludovicianus - loggerhead shrike (SC)
Melanerpes lewis - Lewis' woodpecker (SC)
Numenius americanus - long-billed curlew (SC)
Picoides nuttallii - Nuttall's woodpecker (SLC)
Plegadis chihi - white-faced ibis (SC)
Selasphorus rufus - rufous hummingbird (SC)
Toxostoma redivivum - California thrasher (SC)

Mammals

Ammospermophilus nelsoni - San Joaquin (=Nelson's) antelope squirrel (CA)
Corynorhinus (=Plecotus) townsendii townsendii - Pacific western big-eared bat (SC)
Dipodomys nitratoides brevinasus - short-nosed kangaroo rat (SC)
Eumops perotis californicus - greater western mastiff-bat (SC)
Myotis ciliolabrum - small-footed myotis bat (SC)
Myotis volans - long-legged myotis bat (SC)
Myotis yumanensis - Yuma myotis bat (SC)
Onychomys torridus ramona - Southern grasshopper mouse (SC)
Perognathus inornatus - San Joaquin pocket mouse (SC)

Plants

Layia munzii - Munz's tidy-tips (SC)

FIREBAUGH (381C)

Listed Species

Invertebrates

Branchinecta lynchi - vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus - valley elderberry longhorn beetle (T)

Fish

Hypomesus transpacificus - delta smelt (T)
Oncorhynchus mykiss - Central Valley steelhead (T)

Amphibians

Rana aurora draytonii - California red-legged frog (T)

Reptiles

Gambelia (=Crotaphytus) sila - blunt-nosed leopard lizard (E)
Thamnophis gigas - giant garter snake (T)

Birds

Haliaeetus leucocephalus - bald eagle (T)

Mammals

Dipodomys ingens - giant kangaroo rat (E)
Dipodomys nitratoides exilis - Fresno kangaroo rat (E)
Vulpes macrotis mutica - San Joaquin kit fox (E)

Species of Concern

Invertebrates

Branchinecta mesovallensis - Midvalley fairy shrimp (SC)
Linderiella occidentalis - California linderiella fairy shrimp (SC)
Lytta molesta - molestan blister beetle (SC)

Fish

Pogonichthys macrolepidotus - Sacramento splittail (SC)
Spirinchus thaleichthys - longfin smelt (SC)

Amphibians

Spea hammondii (was Scaphiopus h.) - western spadefoot toad (SC)

Reptiles

Anniella pulchra pulchra - silvery legless lizard (SC)
Clemmys marmorata marmorata - northwestern pond turtle (SC)
Clemmys marmorata pallida - southwestern pond turtle (SC)
Phrynosoma coronatum frontale - California horned lizard (SC)

Birds

Agelaius tricolor - tricolored blackbird (SC)
Athene cunicularia hypugaea - western burrowing owl (SC)
Branta canadensis leucopareia - Aleutian Canada goose (D)
Buteo regalis - ferruginous hawk (SC)

Buteo Swainsoni - Swainson's hawk (CA)
Calypte costae - Costa's hummingbird (SC)
Carduelis lawrencei - Lawrence's goldfinch (SC)
Chaetura vauxi - Vaux's swift (SC)
Charadrius montanus - mountain plover (SC)
Elanus leucurus - white-tailed (=black shouldered) kite (SC)
Empidonax traillii brewsteri - little willow flycatcher (CA)
Falco peregrinus anatum - American peregrine falcon (D)
Grus canadensis tabida - greater sandhill crane (CA)
Lanius ludovicianus - loggerhead shrike (SC)
Melanerpes lewis - Lewis' woodpecker (SC)
Numenius americanus - long-billed curlew (SC)
Picoides nuttallii - Nuttall's woodpecker (SLC)
Plegadis chihi - white-faced ibis (SC)
Selasphorus rufus - rufous hummingbird (SC)
Toxostoma redivivum - California thrasher (SC)

Mammals

Ammospermophilus nelsoni - San Joaquin (=Nelson's) antelope squirrel (CA)
Corynorhinus (=Plecotus) townsendii townsendii - Pacific western big-eared bat (SC)
Dipodomys nitratoides brevinasus - short-nosed kangaroo rat (SC)
Eumops perotis californicus - greater western mastiff-bat (SC)
Myotis ciliolabrum - small-footed myotis bat (SC)
Myotis volans - long-legged myotis bat (SC)
Myotis yumanensis - Yuma myotis bat (SC)
Perognathus inornatus - San Joaquin pocket mouse (SC)

Plants

Atriplex minuscula - lesser saltscale (SC)
Atriplex vallicola - Lost Hills saltbush (=crownscale) (SC)
Layia munzii - Munz's tidy-tips (SC)

MENDOTA DAM (381D)

Listed Species

Invertebrates

Branchinecta lynchi - vernal pool fairy shrimp (T)
Desmocerus californicus dimorphus - valley elderberry longhorn beetle (T)

Fish

Hypomesus transpacificus - delta smelt (T)
Oncorhynchus mykiss - Central Valley steelhead (T)

Amphibians

Ambystoma californiense - California tiger salamander, central pppulation (T)

Rana aurora draytonii - California red-legged frog (T)

Reptiles

Gambelia (=Crotaphytus) sila - blunt-nosed leopard lizard (E)
Thamnophis gigas - giant garter snake (T)

Birds

Haliaeetus leucocephalus - bald eagle (T)

Mammals

Dipodomys nitratoides exilis - Fresno kangaroo rat (E)
Vulpes macrotis mutica - San Joaquin kit fox (E)

Species of Concern

Invertebrates

Branchinecta mesovallensis - Midvalley fairy shrimp (SC)
Linderiella occidentalis - California linderiella fairy shrimp (SC)
Lytta molesta - molestan blister beetle (SC)

Fish

Pogonichthys macrolepidotus - Sacramento splittail (SC)
Spirinchus thaleichthys - longfin smelt (SC)

Amphibians

Spea hammondii (was Scaphiopus h.) - western spadefoot toad (SC)

Reptiles

Clemmys marmorata marmorata - northwestern pond turtle (SC)
Clemmys marmorata pallida - southwestern pond turtle (SC)
Phrynosoma coronatum frontale - California horned lizard (SC)

Birds

Agelaius tricolor - tricolored blackbird (SC)
Athene cunicularia hypugaea - western burrowing owl (SC)
Branta canadensis leucopareia - Aleutian Canada goose (D)
Buteo regalis - ferruginous hawk (SC)
Buteo Swainsoni - Swainson's hawk (CA)
Calypte costae - Costa's hummingbird (SC)
Carduelis lawrencei - Lawrence's goldfinch (SC)
Chaetura vauxi - Vaux's swift (SC)
Charadrius montanus - mountain plover (SC)
Elanus leucurus - white-tailed (=black shouldered) kite (SC)
Empidonax traillii brewsteri - little willow flycatcher (CA)
Falco peregrinus anatum - American peregrine falcon (D)
Grus canadensis tabida - greater sandhill crane (CA)

Lanius ludovicianus - loggerhead shrike (SC)
Melanerpes lewis - Lewis' woodpecker (SC)
Numenius americanus - long-billed curlew (SC)
Picoides nuttallii - Nuttall's woodpecker (SLC)
Plegadis chihi - white-faced ibis (SC)
Selasphorus rufus - rufous hummingbird (SC)
Toxostoma redivivum - California thrasher (SC)

Mammals

Ammospermophilus nelsoni - San Joaquin (=Nelson's) antelope squirrel (CA)
Corynorhinus (=Plecotus) townsendii townsendii - Pacific western big-eared bat (SC)
Dipodomys nitratoides brevinasus - short-nosed kangaroo rat (SC)
Eumops perotis californicus - greater western mastiff-bat (SC)
Myotis ciliolabrum - small-footed myotis bat (SC)
Myotis volans - long-legged myotis bat (SC)
Myotis yumanensis - Yuma myotis bat (SC)
Perognathus inornatus - San Joaquin pocket mouse (SC)

Plants

Atriplex cordulata - heartscale (SC)
Atriplex minuscula - lesser saltscale (SC)
Sagittaria sanfordii - valley sagittaria (=Sanford's arrowhead) (SC)

County Lists

No county species lists requested.

Key:

(E) *Endangered* - Listed (in the Federal Register) as being in danger of extinction.
(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.
(P) *Proposed* - Officially proposed (in the Federal Register) for listing as endangered or threatened.
(NMFS) Species under the Jurisdiction of the National Marine Fisheries Service. Consult with them directly about these species.
Critical Habitat - Area essential to the conservation of a species.
(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.
(C) *Candidate* - Candidate to become a proposed species.
(CA) Listed by the State of California but not by the Fish & Wildlife Service.
(D) *Delisted* - Species will be monitored for 5 years.
(SC) *Species of Concern*/(SLC) Species of Local Concern - Other species of concern to the Sacramento Fish & Wildlife Office.
(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.
(X) *Critical Habitat* designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, or may be affected by projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regard-less of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the quad or quads covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the nine surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environmental documents prepared for your project.

State-Listed Species

If a species has been listed as threatened or endangered by the State of California, but not by us nor by the National Marine Fisheries Service, it will appear on your list as a Species of Concern. However you should contact the California Department of Fish and Game Wildlife and Habitat Data Analysis Branch for official information about these species.

Your Responsibilities Under the Endangered Species Act

All plants and animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

> Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal consultation with the Service.

  During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

  Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our critical habitat page for maps.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

Your list may contain a section called Species of Concern. This is an informal term that refers to those species that the Sacramento Fish and Wildlife Office believes might be in need of concentrated conservation actions. Such conservation actions vary depending on the health of the populations and degree and types of threats. At one extreme, there may only need to be periodic monitoring of populations and threats to the species and its habitat. At the other extreme, a species may need to be listed as a Federal threatened or endangered species. Species of concern receive no legal protection and the use of the term does not necessarily mean that the species will eventually be proposed for listing as a threatened or endangered species.

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6580.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed, candidate and special concern species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be March 15, 2006.

California Endangered Species Act
Biological Opinion, Mendota Wildlife Area
Comprehensive Management Plan

California Endangered Species Act
Biological Opinion
Mendota Wildlife Area Comprehensive Management Plan

Summary

Pursuant to Section 2090 of the California Endangered Species Act (CESA), the Department of Fish and Game's Mendota Wildlife Management Area has requested internal consultation with the Department of Fish and Game (DFG) to determine if the proposed comprehensive management plan would jeopardize the continued existence of any threatened or endangered species. The proposed project lies within the range of the State listed-threatened, Federally listed-endangered San Joaquin kit fox, State and federally listed-endangered Fresno kangaroo rat, State listed Threatened Swainson's hawk, Federally listed-Threatened Aleutian Canada goose, State listed-Threatened Giant garter snake. The proposed project areas also lies within the range of several species proposed for listing by either the State and or Federal Government. These species include: Western pond turtle and tricolored blackbird. According to Natural Diversity Data Base records, several sensitive plant species including: Ferris's birds beak (Cordylanthus palmatus), Hoover's Eriastrum (Eriastrum hooveri), San Joaquin Wooley-threads (Lembertia congdonii), and Lost Hill Saltbush (Atriplex vallicola) may occur within the range of the proposed project area and are included in this Biological Opinion. The DFG has determined that the project would not be likely to jeopardize the continued existence of the above listed species provided the Department's Mendota Wildlife Area fully implements and adheres to the conditions to avoid jeopardy in this Biological Opinion.

Project Description

The intent of the proposed Mendota Wildlife Area Management Plan is to outline long term goals for operation and management as well as short term objectives and tasks to meet those goals on 12,158 acres of habitat. Principal habitat types on the area include: 7,365 acres seasonally managed wetland, 635 acre of semi-permanent and permanent wetland, 735 acres of riparian habitat, 276 acres of saltbush scrub, 1,273 acres of managed upland, and 1,121 acres of natural upland. The plan also establishes the parameter of appropriate public use of the wildlife area, and identifies opportunity for that public use without damaging the area or its resources.

Project Effects on Listed Species

Sensitive Plants

Major representative plant communities and habitat types present include: seasonally flooded freshwater emergent wetland, valley foothill riparian, and to a lesser extent, alkali sink scrub. Natural Diversity Data Base records indicate the following rare, threatened or endangered species have been sighted on or near the area in recent times:

Ferris' bird's beak — Cordylanthus palmatus
(CA Endangered, Fed. Endangered)

Hoover's eriastrum — Eriastrum hooveri
(Fed. Threatened)

San Joaquin Wooly-threads — Lembertia congdonii
(Fed. Endangered)

Conditions to Avoid Jeopardy

1. Conduct an area wide botanical survey by a qualified botanist during the appropriate seasons when these and other species are identifiable. Assemble a comprehensive list of all botanical species, and map all known populations of sensitive species within the wildlife area.

2. Prior to implementation of specific habitat development projects or maintenance tasks within habitat types known to be suitable for the above sensitive species, a botanical survey should be conducted during the appropriate time of year to determine if any sensitive species are present. If a sensitive plant is present, the Regional Plant Ecologists should be notified for consultation to develop measures which will avoid direct or indirect take of the species. If take is unavoidable, measures should be adopted to mitigate/compensate for the loss.

Giant garter snake

The giant garter snake is one of six subspecies of western garter snakes. It is believed extant in wetland habitats and along vegetated permanent water channels in scattered sub-populations in the Central Valley from Butte County in the north to Fresno County in the south. It is believed extirpated from the vicinity of Bane Vista and Tulare Lakes south of Fresno County. According to Natural Diversity Data Base records, Giant garter snakes have not been reported from within the project area. However, several sightings have been reported within the adjacent Fresno Slough (Mendota Pool) between 1972 and 1976. Department staff have

reported possible sightings there as recently as 1987, but specimens have not been caught for identification. The Giant garter snake has been reported in the vicinity of the Mendota Wildlife Area.

Giant garter snakes are always found in close proximity to permanent or semi-permanent water with vegetated perimeters. The giant garter snake is an aquatic feeder specializing capturing small fish and frogs in or under water. The giant garter snake spends the winter in upland retreats above the high water level.

The proposed project area currently contains usable habitat for the giant garter snake, and recent sightings of the species exist. The project as planned will have no adverse impact upon this species. It is expected that implementation of the goals and objectives of this project will result in a net increase of usable habitat for the species.

Conditions to Avoid Jeopardy:

1. Operation and maintenance activities conducted within or near habitat suitable for Giant garter snakes should be conducted between May 1 and October 1, during the snakes active period.

2. Cleaning of ditches and canals should be done from one side of the canal only. This will ensure the maintenance of suitable escape cover for any snakes in the area.

3. Canals in which construction or maintenance activities are planned should be de-watered at least 15 days prior to construction.

4. "Rip rap" installed around water control structures and erodible ditch banks should be place in a manner which will provide escape cover for snakes. A base of river rock should be place on the levee for levee protection; and covered with large pieces of concrete rubble to provide the escape cover.

Aleutian Canada goose

The Aleutian Canada goose is one of several small subspecies of Canada geese inhabiting North America. Its range is restricted to the Pacific Flyway. It nests in the Aleutian Islands of Alaska and winters in the Central Valley of California. It is believed the population declined to a level warranting endangered status because of predation in the nesting and summering habitats. The

population wintering in the Central Valley in 1991 was estimated at near 10,000 birds. Six to seven thousand of these spend the late winter months in the San Joaquin Valley. While in the San Joaquin Valley, the Aleutian Canada goose feeds in grazed pastures, natural grasslands and harvested a cereal grain fields. It roosts in flooded seasonal wetlands and loafs in both its feeding and roosting habitats.

The proposed project will have no adverse impact upon or jeopardize the continued existence of Aleutian Canada Geese. The project will provide additional loafing and roosting sites within the Mendota Wildlife Area. Future tasks within the Mendota Wildlife Area will focus on improvement of foraging habitat for this species.

Swainson's Hawk

This species is the most migratory of all North American buteos. It breeds and summers in the arid and semi-arid regions of western North America and winters on the Pampas of Argentina. The breeding population in California has declined by an estimated 90 percent. In 1979, the breeding population in California was estimated at 375 pairs. This species arrives in the vicinity of the North Grasslands WA in late February to early March each year. It nests within an intermix of trees. Trees commonly used for nesting in this area are cottonwoods, willows and valley oaks. The principle food in the Central valley is meadow mice and small birds. Use of the area by Swainson's hawk coincides with the time of year when most of the seasonal wetlands have been allowed to dry for their annual growing season. Likewise, this species migrates south prior to the seasonal wetlands being flooded for wintering wildlife populations arriving in the fall.

Based upon Natural Diversity Data Base records, and observations by DFG staff, no known Swainson's Hawk nest sites occur within the Mendota WA Plan project area. Nest sites do occur along the San Joaquin River. Swainson's hawks are featured species in the management plan and will benefit from proposed projects. Grassland foraging areas and potential nest trees will be protected and maintained. The proposed project will not effect or jeopardize the continued existence of this species in this region of it's range.

Conditions to Avoid Jeopardy:

1. Restrict development, maintenance and public use activities from March 1 to September 15 near nest sites. Activities should be minimized within 0.25 miles of nest sites from March 1 to June 15 and within 250 yards from June 15 to

August 15. Seasonal closures of tour routes and parking lots will be done as necessary during the breeding season.

2. Maintain nest tree density of 3 to 27 trees per 100 acres in selected fields to encourage nesting. No Swainson's hawk nest tree and/or nest will be removed during the nesting season of March 1 to August 15.

3. Identify and protect key grassland foraging areas.

San Joaquin kit fox

San Joaquin kit fox, a State-listed Threatened and Federally-listed endangered species is a small nocturnal canid which now occurs in scattered populations form Contra Costa County south to Kern County. Historically, this species occupied extensive areas of semi-arid lands in the San Joaquin Valley. Flat topography in valley bottoms with valley sink scrub, valley saltbush scrub, interior coast range saltbush scrub, nonnative grassland, and alkali playa plain communities (described in Holland, 1986) are the typical habitat, but substantial populations have always inhabited the surrounding low foothills where slopes do not exceed 40o (O'farrell 1983). Agricultural, industrial, and urban developments have caused rapidly increasing rates of habitat loss.

The San Joaquin kit fox is an obligate year-round burrow dweller which feeds largely upon lagamorphs and kangaroo rats (but will utilize whatever prey is locally abundant). Numerous dens are excavated and inhabited in the course of a year and individuals may cover great distances while foraging and/or dispersing.

The San Joaquin kit fox is considered here because of the potential foraging habitat (irrigated pasture and seasonally flooded grassland and alkali sink scrub habitat affected by this project. No known active or potential kit fox dens have been observed within the project area.

Although the proposed project will alter potential foraging habitat, it is not considered to be significant. Annual water management of the restored wetlands will be such that the project lands will continue to support prey species for kit fox during spring summer and fall months. The project site will also continue to be suitable for dispersal of young produced within the geographic area via constructed levees and other features. No potential denning habitat will be affected by this project. The project will not jeopardize critical habitat or the continued existence of this species.

Conditions to Avoid Jeopardy:

1. Within 60 days prior to initiation of construction or maintenance of habitat suitable for use by San Joaquin kit fox, the Department will conduct a pre-activity survey to inventory lands that will be subject to disturbance for the occurrence of endangered species.

2. To the extent possible, habitat development and maintenance activities during evening hours (when kit foxes are active and most vulnerable to vehicle or equipment-induced injury or mortality) shall be minimized.

3. Use of rodenticides and herbicides on the site shall be permitted only if it is part of a Department approved management plan or unless such use is otherwise approved on a case-by-case basis. This is necessary to prevent primary or secondary poisoning of endangered species utilizing adjacent habitats, and the depletion of prey upon which kit foxes depend.

Fresno kangaroo rat

The Fresno kangaroo rat is one of three subspecies of the San Joaquin kangaroo rat. The subspecies has specialized hind limbs for hopping locomotion and external cheek pouches for transport of grass and forb seeds (the principal food items) to the underground burrow systems. Like all kangaroo rats, this subspecies has, in addition to long hind legs, a long, tufted tail for balance, a short neck and a comparatively large head with a dorso-ventrally flattened skull. Efficient kidneys maximize retention of water to the point where animals seldom require moisture in the form of free water, obtaining what they require form the foods they eat. The Fresno kangaroo rat is the smallest of the San Joaquin kangaroo rats with a total length of 8.9 inches, including a 4.9-inch tail. Adults weigh about 1.2 ounces Pelage is dark yellowish-buff dorsally and white ventrally. A white stripe extends along the flanks and on the sides of the tufted tail. San Joaquin kangaroo rats have four toes on the hind foot. Other similar species have five hind foot toes except for Merriam's, which also has four.

The historic range of the Fresno kangaroo rat extended from north central Merced County, south through southwestern Madera and Central Fresno counties. Estimates of current population distribution and population size are unknown but assumed to be restricted and small. Fresno kangaroo rats occupy alkali sink habitats between 200 and 300 feet in elevation. Terrain is level to gently sloping and consists of alkaline clay based soils subject to seasonal flooding. Typical plants within this community include seep weed, Iodine bush, saltbush, pepper-grass, filaree, wild oats and foxtail fescue.

Loss of habitat and subsequent extirpation of resident Fresno kangaroo rat populations due to agricultural conversion of native habitats is the principal cause of mortality and population decline. The plan establishes a goal of maintaining existing suitable habitat for Fresno kangaroo rats. Implementation of the plan will not adversely impact the species.

Conditions to Avoid Jeopardy:

1. Within 60 days prior to initiation of construction or maintenance of habitat suitable for use by Fresno kangaroo rats, the Department will conduct a pre-activity survey according to Department approved methodology, to inventory lands that will be subject to disturbance, for the occurrence of endangered species.

2. To the extent possible, habitat development and maintenance activities during evening hours (when Fresno kangaroo rats are active and most vulnerable to vehicle or equipment-induced injury or mortality) shall be minimized.

3. Use of rodenticides and herbicides on the site shall be permitted only if it is part of a Department approved management plan or unless such use is otherwise approved on a case-by-case basis. This is necessary to prevent primary or secondary poisoning of endangered species utilizing adjacent habitats, and the depletion of prey.

Blunt-nosed Leopard Lizard

The blunt-nosed leopard lizard a relatively robust species with a large blunt head. Historically it was distributed over the San Joaquin Valley and adjacent foothills, plains, and valleys. Adults are approximately 3.5 to 5 inches in snout-vent length, and may be up to 13 inches in total length. Coloration consists of a light grayish, tan, or brown background with a conspicuous pattern of dark overlaying spots and pale crossbars. During the courtship season (spring) both sexes may develop reddish markings on the sides, tail, and underside. From 2-3 eggs are laid in excavated chambers at the end or rodent burrows. Hatchlings emerge in early August.

Blunt-nosed leopard lizards are active during the day, usually when air temperatures are between 75 and 95 degrees Fahrenheit. Most activity occurs between the months of April and early October. Animals will over winter underground in rodent burrows. Food consists primarily of insects such as grasshoppers, although smaller lizards may also be consumed.

Leopard lizards occur on "sparsely vegetated" plains, lower canyon slopes, on valley floors, and in washes. Associated vegetation may include a variety of grasses, saltbush (Atriplex spp.), goldenbush (Happlopappus sp.), iodine bush (Allenrolfea occidentalis), and seep-weed (Suaeda fruticosa). Results of systematic inventories for the species on federal lands in the San Joaquin Valley region have demonstrated that this species exhibits an affinity for open habitats, wash systems, and relatively low topography.

Population densities of blunt-nosed leopard lizards are highly variable. Chesemore (1980), in a study of two sites near Taft (Kern County), estimated densities between 0.1 and 0.5 lizards per acre. Densities of blunt-nosed leopard lizards at Pixley National Wildlife Refuge (Tulare County) ranged from 0.12 to 4.14 lizards per acre (Uptain et al., 1985).

Habitat loss is the principal reason for both State and Federal listing. Much of the historical habitat of this species has been altered as a result of agricultural production. Data generated by the California Department of Fish and Game show that approximately 93 percent of historic wildlands present in the San Joaquin Valley were lost by 1979; remaining habitats (exclusive of those receiving current protection) will be lost under present rates.

The plan establishes a goal of maintaining existing suitable habitat for blunt-nosed leopard lizards. Implementation of the plan will not adversely impact the species.

Conditions to Avoid Jeopardy:

1. Within 60 days prior to initiation of construction or maintenance of habitat suitable for use by blunt-nosed leopard lizards, the Department will conduct a pre-activity survey according to Department approved methodology, to inventory lands that will be subject to disturbance, for the occurrence of endangered species.

2. To the extent possible, habitat development and maintenance activities should be restricted to daylight hours, when blunt-nosed leopard lizards are most active and capable of escaping potential harm.

3. Use of rodenticides and herbicides on the site shall be permitted only if it is part of a Department approved management plan or unless such use is otherwise approved on a case-by-case basis. This is necessary to prevent primary or secondary poisoning of endangered species utilizing adjacent

habitats, and the depletion of prey.

INCIDENTAL TAKE

Incidental take of the above described species is not likely to occur because of avoidance measures included and the existing conditions of lands and habitat within the proposed project area.

CONCLUSION

The Department of Fish and Game has determined that the proposed project would not be likely to jeopardize the continued existence of the Threatened and Endangered species identified in this biological opinion.

ENDANGERED AND THREATENED ANIMALS OF CALIFORNIA

State of California
The Resources Agency
DEPARTMENT OF FISH AND GAME
Natural Heritage Division
Natural Diversity Data Base

April 1996

This is a list of the species or subspecies of animals found within California or off the coast of the State that have been classified as Endangered or Threatened by the California Fish and Game Commission (state list) or by the U.S. Secretary of the Interior or the U.S. Secretary of Commerce (federal list).

The official California listing of Endangered and Threatened animals is contained in the California Code of Regulations, Title 14, Section 670.5. The official federal listing of Endangered and Threatened animals is published in the Federal Register, 50 CFR 17.11.

Animals that are candidates for state listing and animals proposed for federal listing are also included on this list. A state candidate species is one that the Fish and Game Commission has formally noticed as being under review by the Department for addition to the state list. A federal proposed species is one for which a proposed regulation has been published in the Federal Register.

Code Designation:	Totals as of April 1996
SE = State-listed Endangered	46
ST = State-listed Threatened	30
FE = Federally listed Endangered	61
FT = Federally listed Threatened	28
SCE = State candidate (Endangered)	0
SCT = State candidate (Threatened)	0
FPE = Federally proposed (Endangered)	12
FPT = Federally proposed (Threatened)	5
Total number of animals listed	123
Total number of candidate/proposed animals	17
Number of animals State listed only	34
Number of animals Federally listed only	47
Number listed under both State & Federal Acts	42

Common and scientific names are shown as they appear on the state or federal lists. If the nomenclature differs for a species that is included on both lists, the state nomenclature is given and the federal nomenclature is shown in a footnote. Also, other synonyms and name changes are footnoted. Footnotes are indicated in parentheses. Changes to this update of the list are denoted by *

	CLASSIFICATION			
	State	List Date	Federal	List Date
GASTROPODS				
Trinity bristle snail (Monadenia setosa)	ST(1)	10-2-80		
Morro shoulderband (Helminthoglypta walkeriana)			FE	1-17-95
CRUSTACEANS				
Riverside fairy shrimp (Streptocephalus woottoni)			FE	8-3-93
Conservancy fairy shrimp (Branchinecta conservatio)			FE	9-19-94
Longhorn fairy shrimp (Branchinecta longiantenna)			FE	9-19-94
Vernal pool fairy shrimp (Branchinecta lynchi)			FT	9-19-94
San Diego fairy shrimp (Branchinecta sandiegoensis)			FPE	8-4-94
Vernal pool tadpole shrimp (Lepidurus packardi)			FE	9-19-94
Shasta crayfish (Pacifastacus fortis)	SE	10-2-80	FE	9-30-88
California freshwater shrimp (Syncaris pacifica)	SE	10-2-80	FE	10-31-88
INSECTS				
Zayante band-winged grasshopper (Trimerotropis infantilis)			FPE	5-10-94
Santa Cruz rain beetle (Pleocoma conjugens conjugens)			FPE	5-10-94
Mount Herman June beetle (Polyphylla barbata)			FPE	5-10-94
Delta green ground beetle (Elaphrus viridis)			FT	8-8-80
Valley elderberry longhorn beetle (Desmocerus californicus dimorphus)			FT	8-8-80
Kern primrose sphinx moth (Euproserpinus euterpe)			FT	4-8-80
Mission blue butterfly (Icaricia icarioides missionensis)			FE	6-1-76
Lotis blue butterfly (Lycaeides argyrognomon lotis)			FE	6-1-76
Palos Verdes blue butterfly (Glaucopsyche lygdamus palosverdesensis)			FE	7-2-80
El Segundo blue butterfly (Euphilotes [=Shijimiaeoides] battoides allyni)			FE	6-1-76
Smith's blue butterfly (Euphilotes [=Shijimiaeoides] enoptes smithi)			FE	6-1-76
San Bruno elfin butterfly (Incisalia mossi bayensis)			FE	6-1-76
Lange's metalmark butterfly (Apodemia mormo langei)			FE	6-1-76
Bay checkerspot butterfly (Euphydryas editha bayensis)			FT	10-18-87
Quino checkerspot (Euphydryas editha quino)			FPE	8-4-94

Laguna Mountains skipper (Pyrgus ruralis lagunae)			FPE	8-4-94
Callippe silverspot butterfly (Speyeria callippe callippe)			FPE	2-4-94
Behren's silverspot butterfly (Speyeria zerene behrensii)			FPE	2-4-94
Oregon silverspot butterfly (Speyeria zerene hippolyta)			FT	7-2-80
Myrtle's silverspot butterfly (Speyeria zerene myrtleae)			FE	6-22-92
Delhi Sands flower-loving fly (Rhaphiomidas terminatus abdominalis)			FE	9-23-93
FISHES				
Winter-run chinook salmon (Oncorhynchus tshawytscha)	SE	9-22-89	FE	3-23-94
Coho salmon-Central California ESU(2) (Oncorhynchus kisutch)	SE(3)	12-31-95	FPT	7-25-95
Coho salmon-So. Oregon/No. California ESU (Oncorhynchus kisutch)			FPT	7-25-95
Little Kern golden trout (Oncorhynchus(5) aguabonita whitei)			FT	4-13-78
Lahontan cutthroat trout			FT	7-16-75
(Oncorhynchus(6) clarki henshawi)			FE	10-13-70
Paiute cutthroat trout			FT	7-16-75
(Oncorhynchus(7) clarki seleniris)			FE	3-11-67
Klamath Mountains Province Steelhead (Oncorhynchus mykiss)			FPT	3-16-95
Bull trout (Salvelinus confluentus)	SE	10-2-80		
Delta smelt (Hypomesus transpacificus)	ST	12-9-93	FT	3-5-93
Mohave tui chub (Gila bicolor mohavensis)	SE	6-27-71	FE	10-13-70
Owens tui chub (Gila bicolor snyderi)	SE	1-10-74	FE	8-5-85
Tecopa pupfish (Extinct)	Delisted 1987			
(Cyprinodon nevadensis calidae)	SE	6-27-71		
Bonytail(8)	SR	6-27-71	FE	4-23-80
(Gila elegans)	SE	1-10-74		
Sacramento splittail (Pogonichthys macrolepidotus)			FPT	1-6-94
Colorado squawfish (Ptychocheilus lucius)	SE	6-27-71	FE	3-11-67
Lost River sucker	SR	6-27-71	FE	7-18-88
(Deltistes luxatus)	SE	1-10-74		
Modoc sucker	SR	1-10-74	FE	6-11-85
(Catostomus microps)	SE	10-2-80		
Shortnose sucker	SR	6-27-71	FE	7-18-88
(Chasmistes brevirostris)	SE	1-10-74		
Razorback sucker	SR	6-27-71	FE	0-23-91
(Xyrauchen texanus)	SE	1-10-74		
Desert pupfish (Cyprinodon macularius)	SE	10-2-80	FE	3-31-86
Cottonball Marsh pupfish (Cyprinodon salinus milleri)	ST	1-10-74		
Owens pupfish (Cyprinodon radiosus)	SE	6-27-71	FE	3-11-67
Thicktail chub (Extinct)	Delisted 10-2-80			
(Gila crassicauda)	SE	1-10-74		
Unarmored threespine stickleback (Gasterosteus aculeatus williamsoni)	SE	6-27-71	FE	10-13-70

Tidewater goby (Eucyclogobius newberryi)			FE	2-4-94
Rough sculpin (Cottus asperrimus)	ST	1-10-74		
AMPHIBIANS				
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	SE	6-27-71	FE	3-11-67
Siskiyou Mountains salamander (Plethodon stormi)	ST	6-27-71		
Tehachapi slender salamander (Batrachoseps stebbinsi)	ST	6-27-71		
Kern Canyon slender salamander (Batrachoseps simatus)	ST	6-27-71		
Desert slender salamander (Batrachoseps aridus)	SE	6-27-71	FE	6-4-73
Shasta salamander (Hydromantes shastae)	ST	6-27-71		
Limestone salamander (Hydromantes brunus)	ST	6-27-71		
Black toad (Bufo exsul)	ST	6-27-71		
Arroyo southwestern toad (Bufo microscaphus californicus)			FE	1-17-95
California red-legged frog (Rana aurora draytonii)			FPE	2-2-94
REPTILES				
Desert tortoise (Gopherus [=Xerobates] agassizii)	ST	8-3-89	FT	4-2-90
Green sea turtle			FT	7-28-78
(Chelonia mydas)			FE	10-13-70
Loggerhead sea turtle (Caretta caretta)			FT	7-28-78
Olive (=Pacific) Ridley sea turtle (Lepidochelys olivacea)			FT	7-28-78
Leatherback sea turtle (Dermochelys coriacea)			FE	6-2-70
Barefoot banded gecko (Coleonyx switaki)	ST	10-2-80		
Coachella Valley fringe-toed lizard (Uma inornata)	SE	10-2-80	FT	9-25-80
Blunt-nosed leopard lizard (Gambelia silus) (9)	SE	6-27-71	FE	3-11-67
Flat-tailed horned lizard (Phrynosoma mcallii)			FPT	11-29-93
Island night lizard (Xantusia [=Klauberina] riversiana)			FT	8-11-67
Black legless lizard(10) (Anniella pulchra nigra)			FPE	8-2-95
Southern rubber boa (Charina bottae umbratica)	ST	6-27-71		
Alameda whipsnake (Masticophis lateralis euryxanthus)	ST	6-27-71	FPE	2-4-94
San Francisco garter snake (Thamnophis sirtalis tetrataenia)	SE	6-27-71	FE	3-11-67
Giant garter snake (Thamnophis couchi gigas) (11)	ST	6-27-71	FT	10-20-93

BIRDS

California brown pelican	SE	6-27-71	FE	10-13-70
(Pelecanus occidentalis californicus)				
Aleutian Canada goose			FT	12-12-90
(Branta canadensis leucopareia)			FE	3-11-67
California condor	SE	6-27-71	FE	3-11-67
(Gymnogyps californianus)				
Bald eagle	SE(rev)	10-2-80	FT	8-11-95
(Haliaeetus leucocephalus)	SE	6-27-71	FE(rev)	2-14-78
			FE	3-11-67
Swainson's hawk	ST	4-17-83		
(Buteo swainsoni)				
Peregrine falcon			FE(S/A)(12)	3-20-84
(Falco peregrinus)				
American peregrine falcon	SE	6-27-71	FE	10-13-70
(Falco peregrinus anatum)				
Arctic peregrine falcon (Recovered)			Delisted	10-5-94
(Falco peregrinus tundrius)			FT	3-20-84
			FE	10-13-70
California black rail	ST	6-27-71		
(Laterallus jamaicensis coturniculus)				
California clapper rail	SE	6-27-71	FE	10-13-70
(Rallus longirostris obsoletus)				
Light-footed clapper rail	SE	6-27-71	FE	10-13-70
(Rallus longirostris levipes)				
Yuma clapper rail	ST	2-22-78	FE	3-11-67
(Rallus longirostris yumanensis)	SR	6-27-71		
Greater Sandhill crane	ST	4-17-83		
(Grus canadensis tabida)				
Western snowy plover(13)			FT	4-5-93
(Charadrius alexandrinus nivosus)				
California least tern	SE	6-27-71	FE	10-13-70
(Sterna antillarum browni)(14)				
Marbled murrelet	SE	3-12-92	FT	9-30-92
(Brachyramphus marmoratus)				
Western yellow-billed cuckoo	SE	3-26-88		
(Coccyzus americanus occidentalis)	ST	6-27-71		
Elf owl	SE	10-2-80		
(Micrathene whitneyi)				
Northern spotted owl			FT	6-22-90
(Strix occidentalis caurina)				
Great gray owl	SE	10-2-80		
(Strix nebulosa)				
Gila woodpecker	SE	3-17-88		
(Melanerpes uropygialis)				
Gilded northern flicker	SE	3-17-88		
(Colaptes auratus chrysoides)				
Willow flycatcher	SE	12-3-90		
(Empidonax traillii)				
Southwestern willow flycatcher			FE	3-29-95
(Empidonax traillii extimus)				
Bank swallow	ST	6-11-89		
(Riparia riparia)				
California gnatcatcher			FT	3-30-93
(Polioptila californica)				
San Clemente loggerhead shrike			FE	8-11-77
(Lanius ludovicianus mearnsi)				
Arizona Bell's vireo	SE	3-17-88		
(Vireo bellii arizonae)				
Least Bell's vireo	SE	10-2-80	FE	5-2-86
(Vireo bellii pusillus)				
Inyo California towhee	SE	10-2-80	FT	8-3-87
(Pipilo crissalis eremophilus)				

San Clemente sage sparrow (Amphispiza belli clementeae)			FT	8-11-77
Belding's savannah sparrow (Passerculus sandwichensis beldingi)	SE	1-10-74		
MAMMALS				
Riparian brush rabbit (Sylvilagus bachmani riparius)	SE	5-29-94		
Point Arena mountain beaver (Aplodontia rufa nigra)			FE	12-12-91
San Joaquin antelope squirrel (Ammospermophilus nelsoni)	ST	10-2-80		
Mohave ground squirrel (Spermophilus mohavensis)	ST	6-27-71		
Pacific pocket mouse (Perognathus longimembris pacificus)			FE	9-26-94
Morro Bay kangaroo rat (Dipodomys heermanni morroensis)	SE	6-27-71	FE	10-13-70
Giant kangaroo rat (Dipodomys ingens)	SE	10-2-80	FE	1-5-87
Stephens' kangaroo rat (Dipodomys stephensi)	ST	6-27-71	FE	9-30-88
Tipton kangaroo rat (Dipodomys nitratoides nitratoides)	SE	6-11-89	FE	7-8-88
Fresno kangaroo rat	SE	10-2-80	FE	3-1-85
(Dipodomys nitratoides exilis)	SR	6-27-71		
Salt-marsh harvest mouse (Reithrodontomys raviventris)	SE	6-27-71	FE	10-13-70
Amargosa vole (Microtus californicus scirpensis)	SE	10-2-80	FE	11-15-84
Sierra Nevada red fox (Vulpes vulpes necator)	ST	10-2-80		
San Joaquin kit fox (Vulpes macrotis mutica)	ST	6-27-71	FE	3-11-67
Island fox (Urocyon littoralis)	ST	6-27-71		
Guadalupe fur seal (Arctocephalus townsendi)	ST	6-27-71	FT	12-16-85
Northern (Steller) sea lion (Eumetopias jubatus)			FT	4-5-90
Wolverine (Gulo gulo)	ST	6-27-71		
Southern sea otter (Enhydra lutris nereis)			FT	1-14-77
Gray whale (Recovered)			Delisted	6-15-94
(Eschrichtius robustus)			FE	6-2-70
Sei whale (Balaenoptera borealis)			FE	6-2-70
Blue whale (Balaenoptera musculus)			FE	6-2-70
Finback whale(15) (Balaenoptera physalus)			FE	6-2-70
Humpback whale(16) (Megaptera novaeangliae)			FE	6-2-70
Right whale(17) (Balaena glacialis)			FE	6-2-70
Sperm whale (Physeter catodon)(18)			FE	6-2-70
California bighorn sheep (Ovis canadensis californiana)	ST	6-27-71		
Penninsular bighorn sheep (Ovis canadensis cremnobates)	ST	6-27-71	FPE	5-8-92

(1) On January 1, 1985, all species designated as "rare" were reclassified as "threatened", as stipulated by the California Endnagered Species Act.
(2) ESU = evolutionarily significant unit
(3) The State listing is limited to Coho south of San Francisco Bay.
(4) Federal: Oncorhyncus (=Salmo) aguabonita whitei
(5) Federal: Oncorhyncus (=Salmo) clarki henshawi
(6) Federal: Oncorhyncus (=Salmo) clarki seleniris
(7) Federal: Bonytail chub
(8) Federal: Gambelia (=Crotaphytus) silus
(9) Within the coastal areas of Monterey between Carmel & Salinas Rivers only.
(10) Same as Thamnophis gigas
(11) "(S/A)" is the Federal code for "similarity of appearance." (Not included in counts of listed species)
(12) Federal status applies only to Pacific Coast population
(13) Federal: Sterna antillarum (=albifrons) browni
(14) Also know as Fin whale
(15) Also known as Hump-backed whale
(16) Also know as Black right whale
(17) Same as Physeter macrocephalus

State of California
Department of Fish & Game
1416 9th Street
Sacramento, Ca 95814

rev: 4/4/96

Programmatic Biological Opinion on Conveyance Projects

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
3310 El Camino Avenue, Suite 130
Sacramento, California 95821-6340

COPY

IN REPLY REFER TO:
1-1-99-F-36

June 28, 1999

Memorandum

To: Regional Director, Bureau of Reclamation, Mid-Pacific Regional Office, Sacramento, California

From: Field Supervisor, Sacramento Fish and Wildlife Office, Sacramento, California (SFWO)

Subject: Programmatic Biological Opinion on National Wildlife Refuge and Wildlife Area Water Conveyance Projects, Within Tulare, Kern, Fresno, Madera, and Merced Counties, California

This is in response to your request for formal consultation with the U.S. Fish and Wildlife Service (Service) on the Refuge Water Supply Conveyance Projects (Conveyance Project), in three project areas within the San Joaquin Valley, California. These areas include Bureau of Reclamation (Reclamation) Conveyance Projects within the (1) San Joaquin Basin Action Plan and North Grasslands Area, (2) South San Joaquin Valley Study Area, and (3) Mendota Wildlife Area, in Tulare, Kern, Fresno, Madera, and Merced Counties, California. Your January 5, 1999, request was received in our office on January 6, 1999.

This transmits the Service's programmatic formal consultation pursuant to section 7 of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 *et seq.)*, regarding Reclamation projects with relatively small effects on the endangered San Joaquin kit fox (*Vulpes macrotis mutica*), Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*), blunt-nosed leopard lizard (*Gambelia silus*), and federally threatened giant garter snake *(Thamnophis gigas)*, and their habitat. Reclamation projects that meet the conditions within this biological opinion may be appended to this programmatic consultation. The geographic scope of this consultation includes the areas identified in Reclamation's Conveyance Project Environmental Assessments (EA) for the Conveyance Project areas (map).

The purpose of this programmatic consultation is to expedite Reclamation projects with relatively small effects on the San Joaquin kit fox, blunt-nosed leopard lizard, Tipton kangaroo rat, giant garter snake, and the habitats used by these species. Projects that exceed the programmatic threshold will require individual biological opinions.

Most of the impacts associated with the Conveyance Project relate to enlarging existing conveyance facilities. Therefore, most of the habitat impacts occur to riparian and aquatic areas. This programmatic consultation permits projects, with temporary impacts of not more than 94.20 acres and permanent impacts of 17.75 acres, in giant garter snake aquatic/riparian habitat. Temporary disturbance occurs if impacts occur for less than 6 months in riparian/aquatic habitat. Permanent disturbance occurs if impacts occur for more than 6 months in riparian/aquatic habitat. This programmatic consultation also permits projects in agricultural areas, with temporary impacts of less than 45 acres, and permanent impacts of not more than 15.20 acres, in habitat which could be used for foraging by San Joaquin kit fox, blunt-nosed leopard lizard, and Tipton kangaroo rat. The majority of impacted upland habitat will occur within agricultural lands, and as such, provide little value to these species. Temporary disturbance occurs if the impacts occur for less than 2 years for upland species. If the impacts occur for more than 2 years, the impacts are considered permanent for upland species. These figures limit the effects of the programmatic process on these aquatic and upland species, and their habitat.

Background/Consultation History

This biological opinion is based on information provided in the: (1) San Joaquin Basin Action Plan and North Grasslands Area EA (Reclamation 1997a), (2) South San Joaquin Valley Study Area EA and Biological Assessment (Reclamation 1997b), (3) Mendota Wildlife Area EA (Reclamation 1998), (4) biological survey conducted by Reclamation contractor, CH2M Hill, within the Mendota project area, (5) field investigations conducted by Service biologists at Grasslands, South San Joaquin Valley, and Mendota project areas, (6) information from the Grasslands Resource Conservation District, and (7) other information in Service files. A complete administrative record of this consultation is on file in the Sacramento Fish and Wildlife Office (SFWO).

The primary purpose of the Conveyance Project is to provide or upgrade facilities to accommodate "Level 4" refuge water supply as required under the Central Valley Project Improvement Act (CVPIA). Two primary water supply levels, Level 2 and Level 4, have been identified under the CVPIA refuge water supply program. Level 2 water supplies are defined as existing average annual water deliveries; Level 4 water supplies are defined as those quantities of water required for full habitat development for aquatic species within each of the refuge areas. The CVPIA requires Level 4 water supplies to be provided as firm, reliable, long-term entitlements for each refuge. Reclamation, in cooperation with the Service and the California Department of Fish and Game (Department), is responsible for implementing section 3406 (d)(5) of the CVPIA. This section requires that reliable Level 4 water supplies be delivered to the National Wildlife Refuges (NWR's) and state Wildlife Areas specifically included in the CVPIA.

This Conveyance Project consultation addresses the effects of improvements to water conveyance facilities outside the refuges that are necessary to deliver Level 4 water to the refuge boundaries. The effects of taking water from the original source rivers are being addressed in the programmatic biological opinion for the CVPIA. Water may be available for agricultural or other uses during times when the refuges do not require it. If any water is applied to areas outside the scope of this programmatic opinion, separate section 7 consultation must be initiated. Additionally, refuges may convert habitat to wetlands that was previously used by upland species. Refuge activities expected to result from the availability of additional refuge water will be addressed in separate biological opinions on the long-term maintenance and operations of the refuge.

Because of capacity constraints and/or maintenance requirements in existing conveyance systems, facilities need to be improved to provide Level 4 water supplies to San Joaquin Valley Refuges. Water supplies are now conveyed on an as-available basis, which is not consistent with refuge needs. Existing facilities were designed for existing agricultural demands, not to convey peak refuge requirements. Facilities must be improved to support scheduled maximum Level 4 peak flows.

Reclamation contractors and the Service conducted surveys to analyze habitat attributes of the project area during August and September 1998. This analysis was conducted to determine whether the project may affect any federally listed or proposed species. Land areas were examined for habitats that might support federally listed or proposed species known to occur in the vicinity.

Those areas within the range, but outside of habitat parameters for species, were determined to be unsuitable, and will therefore not be considered as part of this consultation. For example, approximately 13,700 linear feet of canals under San Luis Canal Company's ownership, will be lined with concrete. Due to the intensive agriculture in the immediate area, and the heavy existing canal maintenance, it was determined that lining these canals would not likely impact the giant garter snake (*Thamnophis gigas*).

Based on the aforementioned analysis, habitat for several species is not located within project construction areas. No habitat was located for the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), the vernal pool fairy shrimp (*Branchinecta lynchii*), or the vernal pool tadpole shrimp (*Lepidurus packardi*). No habitat was located for San Joaquin woolly-threads (*Lembertia congdonii*), Hoover's wooly-star (*Eriastrum hooveri*), California jewelflower (*Caulanthus californicus*), or Kern mallow (*Eremalche kernensis*). No suitable habitat was located for the California red-legged frog (*Rana aurora draytonii*), Aleutian Canada goose (*Branta canadensis leucopareia*), riparian brush rabbit (*Sylvilagus bachmani riparius*), and riparian woodrat (*Neotoma fuscipes riparia*). Furthermore, this project is not expected to have any impact to downstream

habitats that support Delta smelt (*Hypomesus transpacificus*), or Sacramento splittail (*Pogonichthys macrolepidotus*).

Therefore, the Service has determined that the proposed Conveyance Projects are not likely to adversely affect the valley elderberry longhorn beetle, vernal pool fairy shrimp, vernal pool tadpole shrimp, San Joaquin woolly-threads, Hoover's wooly-star, California jewelflower, Kern mallow, California red-legged frog, Aleutian Canada goose, riparian brush rabbit, riparian woodrat, Delta smelt, or Sacramento splittail. These species will not be addressed further in this document. The following biological opinion addresses the effects of the proposed action on the San Joaquin kit fox, blunt-nosed leopard lizard, Tipton kangaroo rat, giant garter snake, and the habitats upon which they depend.

Conveyance Project Categories

The Service and Reclamation developed this programmatic biological opinion to address the numerous activities to be authorized within project areas. The Conveyance Project involves categories of projects such as (1) water control structures, (2) weirs, (3) drains, (4) turnouts, (5) siphons, (6) pumps, (7) canal construction, improvement, and revegetation for erosion control, (8) pipeline installation and hydrological testing, (9) wells, (10) dam construction, (11) earthfill embankments and small earth dams, (12) electrical distribution lines, (13) removal of obsolete water conveyance structures, (14) rip-rap around water management structures, (15) temporary equipment storage and parking areas, and (16) operations and maintenance activities on Conveyance Project structures.

This programmatic biological opinion includes undesigned refuge water conveyance projects under the following conditions: (1) the biological opinion develops gross impact estimates to generate "sideboards" for the maximum amount of habitat to be disturbed for structures (see **Table 1** for sideboard estimates); (2) impact quantification will be provided as designs are completed for each structure, and compared to the sideboard estimates to determine compliance with this biological opinion; (3) take is authorized for construction in the form of a letter appended to the programmatic opinion, once it has been determined that construction would be consistent with the programmatic opinion.

During informal consultation, the Service and Reclamation decided that new construction could be authorized within the three project areas. These areas are geographically located within the San Joaquin Basin Action Plan (Grasslands), the South San Joaquin Valley Area (Kern and Pixley NWR), and the Department's Mendota Wildlife Area. Prior to construction, Reclamation will provide project information on new designs to the Service, and identify the type of construction within the three project areas. The Service will determine which category the proposed construction fits: (1) not

likely to adversely affect listed species; (2) appropriate to append to this programmatic biological opinion; or (3) needs a separate biological opinion.

Table 1. Effect of construction or modifications within upland or aquatic habitat in Conveyance Project areas.

Major Construction / Modifications	Permanent Upland Loss	Temporary Upland Loss	Permanent Aquatic / Riparian Loss	Temporary Aquatic / Riparian Loss
EA Grasslands	0.00	0.00	0.25 acre, spillway gates	50.30 acres or 87,700 linear feet of canal
EA South SJV	0.00	30.00 acres	0.00	13.90 acres
EA Mendota	0.20 acre	0.00	2.50 acres	0.00
Total	**0.20 acre**	**30.00 acres**	**2.75 acres**	**64.20 acres**
Minor Construction / Modifications, Weirs, etc.				
EA Grasslands	5 acres	5 acres	5 acres	10 acres
EA South SJV	5 acres	5 acres	5 acres	10 acres
EA Mendota	5 acres	5 acres	5 acres	10 acres
Total	**15 acres**	**15 acres**	**15 acres**	**30 acres**
Total For Major and Minor Construction	**Maximum Estimate, not to exceed 15.20 acres**	**Maximum Estimate, not to exceed 45.00 acres**	**Maximum Estimate, not to exceed 17.75 acres**	**Maximum Estimate, not to exceed 94.20 acres**

Programmatic Consultation Guidelines

The proposed construction activities for the Conveyance Project include categories 1 through 16 above. Some refuge water projects have not yet been designed and identified in the three aforementioned Conveyance Project environmental assessments. This consultation takes a programmatic approach for authorizing take that would result from these currently undesigned projects. For take to be authorized under this programmatic opinion for (1) giant garter snakes, (2) San Joaquin kit foxes, (3) Tipton kangaroo rats, and (4) blunt-nosed leopard lizards, the following criteria must be met for new projects:

1. Habitat loss at each construction site will not exceed the amount specified within the effects section of this biological opinion.

2. The cumulative amount of permanent giant garter snake habitat loss for projects will not exceed 17.75 acres of aquatic habitat. The cumulative amount of permanent San Joaquin kit fox, blunt-nosed leopard lizard, and Tipton kangaroo rat habitat loss for projects will not exceed 15.2 acres of upland habitat.

3. Conveyance projects need to minimize impacts to giant garter snakes, San Joaquin kit foxes, blunt-nosed leopard lizards, and Tipton kangaroo rats, and their habitat, to the maximum extent practicable. Consultation between design engineers and a Service-approved biologist familiar with the habitat needs of these species will help minimize impacts.

4. Project activities will comply with the terms and conditions of this biological opinion.

Incidental take of any other listed species cannot be authorized by this opinion.

Implementing Procedure

Major Modifications or Construction Projects, Known Designs: This biological opinion authorizes take for the major construction projects or modifications identified within the San Joaquin Basin Action Plan EA (December 1997), the South San Joaquin Valley EA (April 1997), and Mendota Wildlife Area EA (February 1998). These construction activities do not require a letter from the Service to append actions to this biological opinion because the actions comply with the terms and conditions in this biological opinion.

Undesigned Major Modifications or Construction Projects: This biological opinion can authorize take for the undesigned major projects after these activities have been appended to this opinion. The following procedure will be used to authorize take for each of these major structures, using a programmatic approach under this biological opinion:

1. Reclamation will submit a letter requesting that the proposed activity be appended to this programmatic biological opinion, and provide the Service with the following:

    a. A site plan, with an overlay map showing habitat types at the site, and descriptions of areas to be temporarily and permanently impacted. Area descriptions include open water, marsh, rice field, and canal, as well as the type of disturbed and undisturbed wetland, riparian, upland habitat or agricultural land.

b. Information regarding the number of acres of habitat to be temporarily and permanently impacted for each species identified in this opinion.

c. A project description, including details related to the types of disturbance, project timing, and a discussion addressing how impacts are avoided and minimized to the maximum extent practicable relative to the Service's: (1) *Standard Avoidance and Minimization Measures During Construction Activities in Giant Garter Snake Habitat, Prior to or During Ground Disturbance*; and (2) *Standard Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance* (Attachments).

2. The Service will review the information provided to determine whether the activity meets the criteria for being appended to this biological opinion, or whether a separate biological opinion is necessary.

3. If the Service determines that the activity is appropriate for inclusion under this opinion, the Service will provide a letter appending the activity to this opinion.

BIOLOGICAL OPINION

Description of the Proposed Action

The proposed project involves construction within three project areas in the San Joaquin Valley. These areas include Conveyance Projects in regions identified as the (1) San Joaquin Basin Action Plan and North Grasslands Area, (2) South San Joaquin Valley Study Area (Kern and Pixley NWR), and (3) Mendota Wildlife Area. Construction is not scheduled to occur at this time at the Volta Wildlife Area, San Luis NWR, Merced NWR, or Los Banos Wildlife Area. However, construction actions identified within this biological opinion may be appended to this programmatic biological opinion if it is determined that the actions within these additional areas are conducted for the purpose of providing Conveyance Project water. Such areas include National Wildlife Refuges and State Wildlife Areas located within the San Joaquin Valley portion of the CVPIA.

Major construction will occur at the (1) San Joaquin Basin Action Plan Areas (Grassland Water District areas adjacent to San Luis NWR), (2) Kern and Pixley NWR, and (3) Mendota Wildlife Area. Minor structural modifications will also occur along the canal or pipeline alignments within these areas. The locations for the major projects are shown in the Mendota EA, San Joaquin Basin Action Plan EA, and South San Joaquin Valley EA.

The following information provides a summary regarding (1) major and minor construction, (2) the proposed measures for avoiding and minimizing these impacts, and

(3) the anticipated impacts to giant garter snakes, San Joaquin kit foxes, Tipton kangaroo rats, and blunt-nosed leopard lizards.

A. Major Construction Projects or Modifications; Designs in the Environmental Assessments:

1. San Joaquin Basin Action Plan Conveyance Project (San Luis NWR, Grasslands Resource Conservation District, and Grasslands Water District):

The Dependent Alternative System is the preferred alternative within the San Joaquin Basin Action Plan EA. Reclamation proposes to modify four existing water canals in the project area. The San Luis Canal would be upgraded from 190 cubic feet per second (cfs) to 230 cfs. The Santa Fe Canal would be upgraded from 300 cfs to 350 cfs. The Spillway Ditch would be upgraded from 300 cfs to 350 cfs. The Mosquito Ditch would be upgraded from 120 cfs to 250 cfs. Canals would be improved by silt removal and channel reshaping. Concrete spillway gates will be constructed on existing conveyance facilities within the Grasslands Water District. The EA states that all temporary habitat impacts associated with the Conveyance project (up to 94.20 acres) will be restored to pre-construction condition.

2. South San Joaquin Valley Study Area Conveyance Project (Pixley and Kern NWR):

Reclamation chose the PIX-2B Alternative System as the preferred alternative within the South San Joaquin Valley Study Area EA. A pipeline would be constructed between Friant Kern Canal and Pixley NWR.

The PIX-2B alternative would involve installation of a turnout structure at Friant Kern Canal. Water would be delivered through a 27-inch, 67,000 linear foot, gravity-fed pipeline to Pixley NWR's southern boundary, and would accommodate 14 cfs. Pipeline crossings would be installed along the pipeline corridor, which crosses Highway 99, Southern Pacific Railroad tracks, and 10 local road crossings.

The KER-1A/1B preferred alternative would involve water deliveries that originated from the California Aqueduct at Buena Vista Water Storage District turnout 1B. Water would be conveyed through an existing pipeline to the Main Drain Canal, and then to Goose Lake Canal. Water would enter Kern NWR at the refuge's turnout structure on Goose Lake Canal.

The Main Drain Canal's existing capacity is about 70 cfs. The projected delivery rate at the refuge turnout is approximately 80 cfs. When combined irrigation and refuge flows exceed 70 cfs, additional water for the refuge will be conveyed from turnout 1B to the West Side Canal and into Goose Lake Canal. Improvements to the Main Drain Canal will

allow increased deliveries and reduce maintenance shutdowns. The capacity of the Main Drain Canal will be increased along 12;000 feet of canal. Canal interceptor drains will be installed on both sides, along 22,000 feet, of the canal. The refuge turnout along Goose Lake Canal will be enlarged to accommodate a delivery rate of 80 cfs.

Reclamation chose the KER-1A/1B alternative as the preferred alternative at Kern NWR. However, Reclamation may implement the KER-7 alternative as the preferred alternative, if difficulties are encountered along the KER-1A/1B alignment during construction. The KER-7 alternative is the secondary preferred alternative at Kern NWR. The KER-7 alternative involves construction of a lateral pipeline that begins at the California Aqueduct. The pipeline would carry water from the California Aqueduct to the southwest portion of Kern NWR. A pump station would be installed approximately one-half mile from Kern NWR. Water would be transferred through the Burhan Canal and delivered to the Goose Lake Canal delivery point.

Reclamation anticipates restoring 30 acres of habitat to pre-project conditions within the South San Joaquin Valley project area. This restoration will occur in areas with temporary habitat impacts.

3. Mendota Wildlife Area Conveyance Project (Department cooperative with Reclamation and the Service):

Reclamation's preferred alternative within the Mendota Wildlife Area EA is the Dam Replacement Alternative. The Bureau proposes to replace the existing Mendota Dam to eliminate the required dewatering of Mendota Pool. Currently, Mendota Pool water is delivered to Mendota Wildlife Area. Mendota Pool is dewatered for inspection and maintenance purposes at least once every 2 years. Therefore, year round water delivery is not available at Mendota Wildlife Area. The new dam would allow for conveyance of level 2 water and additional water supplies required for optimal wildlife management at Mendota Wildlife Area (level 4) as required by the CVPIA.

The new dam will be located approximately 400 feet downstream from the existing dam. The existing dam may be eligible for listing with the National Register of Historic Places, and therefore will remain in place, but will no longer be functional. The new dam will consist of earthen embankments with a 115-foot wide gated concrete structure near the center of the San Joaquin River channel.

The preliminary design for radial flood control gates was 10,000 cfs. Normal flows will be passed by a double sluice gate assembly with energy dissipaters and a maximum capacity of 560 cfs. The dam will be designed so that it can be retrofitted with a fish passageway in the future to allow for movements of anadromous fish.

Reclamation anticipates in-kind compensation of 1.20 acres of upland habitat and 2.77 acres of riparian/aquatic habitat, within the Mendota Wildlife Area project site for permanent impacts. This compensation represents "no net loss" of habitat values, and is not associated with endangered species compensation. Compensation will occur near project areas with permanent habitat impacts. The riparian habitat associated with this project alternative (mature, riparian forest) is not conducive to giant garter snake habitation. Constructing Mendota Dam will not impact the giant garter snake.

B. Major Construction Projects or Structural Modifications, Currently Undesigned:

Currently, there is no planned schedule for constructing new structural projects at Conveyance Project areas. As a result, no site-specific design has been initiated for these new projects. Therefore, this biological opinion uses a programmatic approach to authorize take within Conveyance Project areas. When the site-specific design for each major structure has been completed, Reclamation will provide information to the Service regarding the nature and extent of anticipated impacts.

Major construction activities for the Conveyance Project can be appended to this biological opinion when they meet the criteria in the Programmatic Consultation Guidelines for this biological opinion (beginning on page 5). Construction activity can be authorized for incidental take once the Service has finalized a letter stating that the proposed activity (1) meets the criteria in this biological opinion, and (2) is appended to this biological opinion.

C. Minor Construction Projects or Structural Modifications, Currently Undesigned:

Minor construction projects or modifications for the three project areas are necessary for conveying water to the refuges. Minor project categories are listed below.

1. Operations and Maintenance of Existing Facilities: Vegetation removal, clearing, and grading for maintenance purposes. Equipment storage and parking areas will be located throughout the Conveyance Project areas. Canals will be drained to conduct maintenance or repair work. Pipeline repair work will be conducted along alignments.

2. Minor Structures: Water wells and water pumps will be constructed.

3. Electrical Distribution Lines: Electrical distribution lines will be constructed to service pump stations along canals.

4. Demolish or Remove Excess Existing Structures: Minor structures, including old bridges, check structures, or pipelines may be removed from the project areas and replaced with new structures or pipelines.

5. Wing Walls or Bridge Rip Rap: Wing walls are the angular walls that extend into canal banks from any given structure. Most wing wall extensions occur at bridge crossings, where rip rap will also be placed to prevent erosion. Wing wall construction involves clearing soil from around existing wing walls. Concrete is poured to extend walls for better erosion control. Each wing wall extension is expected to disturb areas approximately 60 feet long and 15 feet wide.

6. Minor Canal Structures: Weirs, drains, turnouts, and siphons will be constructed or repaired.

7. Embankment Erosion Control: Landscaping or revegetation work will be conducted around concrete and earth dams.

The approximate amount of habitat disturbance for minor structures is: 15 acres for permanent upland habitat loss, 15 acres for temporary upland habitat disturbance, 15 acres for permanent aquatic habitat loss, and 30 acres for temporary aquatic habitat loss.

The exact amount of habitat affected by construction of each minor structure will not be determined until construction is completed. A qualified biologist will monitor the actual amount and type of habitat affected, as construction proceeds at each site. Maximum estimates provided in this document will be used to set an upper limit of habitat disturbance.

To help prevent injury or mortality to listed species which may occupy burrows in the canals, a qualified, Service-approved biologist will be present during all excavation activities. If an overwintering giant garter snake or resting San Joaquin kit fox is encountered within the construction zone, construction will be halted until the Service advises Reclamation on how to proceed. Service-approved environmental awareness training will be provided to work crews at project sites for the San Joaquin kit fox, blunt-nosed leopard lizard, Tipton kangaroo rat, and giant garter snake.

D. Proposed Avoidance and Minimization Measures for Conveyance Project Areas:

Reclamation will conduct preconstruction surveys in areas where endangered species may occur, to determine if listed species are likely to be incidentally taken. Reclamation proposes to implement the following measures: (1) Service's *Standardized Recommendations For Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance* in project areas; (2) Survey methodologies developed by the California Department of Fish and Game for Tipton kangaroo rats and blunt-nosed leopard lizards; (3) Service's *Guidelines for Restoration and/or Replacement of Giant Garter Snake Habitat* (Attachment), and (4) Service's *Standard Avoidance and Minimization Measures During Construction Activities in Giant Garter Snake Habitat.*

Conservation sites supporting giant garter snake habitat, and/or San Joaquin kit fox, blunt-nosed leopard lizard, and Tipton kangaroo rat habitat would be secured prior to ground-breaking in endangered species habitat wherever permanent impacts will occur. Permanent loss of endangered species habitat will be replaced in-kind (e.g., blunt-nosed leopard lizard habitat will be replaced with suitable blunt-nosed leopard lizard habitat). These conservation sites would be secured though: (1) a conservation bank, (2) fee purchase, (3) conservation easement, (4) or any other mechanism that results in the appropriate endowment for, and the perpetual management of, the site. Conservation would consist of habitat preservation at a ratio of 3 acres preserved for each acre impacted (3:1) for all upland species; the conservation area for giant garter snakes would contain both upland and aquatic habitat components, at a ratio of 2 upland acres and 1 aquatic acre, for each acre impacted (3:1). All restoration, replacement, and monitoring guidelines included in the *Guidelines for Restoration and/or Replacement of Giant Garter Snake Habitat* would be followed. Compensation for temporal losses (all species) involves restoring the site to its pre-existing condition.

Status of the Species/Environmental Baseline

Giant Garter Snake

Historic and Current Distribution: The Service published a proposal to list the giant garter snake as an endangered species on December 27, 1991 (56 **FR** 67046). The Service reevaluated the status of the giant garter snake before adopting the final rule. The giant garter snake was listed as a threatened species October 20, 1993 (58 **FR** 54053). Fitch (1940) described the historical range of the species as extending from the vicinity of Sacramento and Contra Costa counties southward to Buena Vista Lake, near Bakersfield, in Kern County. Prior to 1970, the giant garter snake was recorded historically from 17 localities (Hansen and Brode 1980). Five of these localities were clustered in and around Los Banos in Merced County. These records coincide with the historical distribution of large flood basins, fresh water marshes, and tributary streams. Surveys over the last two decades have located the giant garter snake as far north as Butte Basin in the Sacramento Valley.

As recently as the 1970s, the range of the giant garter snake extended from near Burrel, Fresno County (Hansen and Brode 1980), northward to the vicinity of Chico, Butte County (Rossman and Stewart 1987). California Department of Fish and Game studies (Hansen 1988), indicate that giant garter snake populations are currently distributed in portions of the rice production zones of Sacramento, Sutter, Butte, Colusa, and Glenn Counties; along the western border of the Yolo Bypass in Yolo County; and along the eastern fringes of the Sacramento-San Joaquin River delta from the Laguna Creek-Elk Grove region of central Sacramento County southward to the Stockton area of San Joaquin County.

The California Natural Diversity Database has records of giant garter snake in nine locations in Fresno County. Giant garter snakes were located in 23 locations in Merced County. Seven giant garter snakes were found in 1998, and six as of June 16, 1999, in Los Banos Creek in Merced County. Three snakes were located in 1998, and eight as of June 16, 1999, at the Volta Wildlife Area. As a result, giant garter snakes may be located in areas that are adjacent to Conveyance Project areas.

Habitat Requirements and Reason for Decline: Endemic to wetlands in the Sacramento and San Joaquin valleys, the giant garter snake inhabits marshes, sloughs, ponds, small lakes, low gradient streams, and other waterways and agricultural wetlands, such as irrigation and drainage canals and rice fields. Giant garter snakes feed on small fishes, tadpoles, and frogs (Fitch 1941, Hansen 1980, Hansen 1988). Habitat requisites consist of: (1) adequate water during the snake's active season (early-spring through mid-fall) to provide food and cover; (2) emergent, herbaceous wetland vegetation, such as cattails and bulrushes, for escape cover and foraging habitat during the active season; (3) grassy banks and openings in waterside vegetation for basking; and (4) higher elevation uplands for cover and refuge from flood waters during the snake's dormant season in the winter (Hansen 1980). Giant garter snakes are generally absent from larger rivers and other water bodies that support introduced populations of large, predatory fish, and from wetlands with sand, gravel, or rock substrates (Hansen 1980, Rossman and Stewart 1987, Hansen 1988). Riparian woodlands do not provide suitable habitat because of excessive shade, lack of basking sites, and absence of prey populations (Hansen 1980).

The giant garter snake inhabits small mammal burrows and other soil crevices above prevailing flood elevations throughout its winter dormancy period (i.e., November to mid-March). Giant garter snakes typically select burrows with sunny exposure along south and west facing slopes. Giant garter snakes also use burrows as refugia from extreme heat during their active period. The Biological Resources Division (BRD) of the USGS (Wylie *et al.* 1997) has documented giant garter snakes using burrows in the summer as much as 165 feet (50 meters) away from the marsh edge. Overwintering snakes have been documented using burrows as far as 820 feet (250 meters) from the edge of marsh habitat. Studies conducted by the BRD show that giant garter snakes typically moved little from day to day. However, total activity varied widely between individuals. Snakes have been documented moving up to 5 miles (8 kilometers) over a few days (Wylie *et al.* 1997).

The breeding season extends through March and April, and females give birth to live young from late July through early September (Hansen and Hansen 1990). Brood size is variable, ranging from 10 to 46 young, with a mean of 23 (Hansen and Hansen 1990). Young immediately scatter into dense cover and absorb their yolk sacs, after which they begin feeding on their own. Although growth rates are variable, young typically more than double size by 1 year of age. Sexual maturity averages 3 years for males and 5 years for females.

The giant garter snake currently is known from a small number of populations. The status of these populations and the threats to these snakes and their habitats are detailed in the final rule that listed the giant garter snake as threatened. Many land use practices and other human activities currently threaten the survival of the giant garter snake throughout the remainder of its range. Although some giant garter snake populations have persisted in artificial wetlands associated with agricultural and flood control activities, many of these altered wetlands are now threatened with urban development. Cities within the current range of the giant garter snake that are rapidly expanding include: (1) Chico, (2) Yuba City, (3) Sacramento, (4) Galt, (5) Stockton, (6) Gustine, and (7) Los Banos.

San Joaquin Kit Fox

Historical and Current Distribution. The San Joaquin kit fox was listed as an endangered species in 1967 (32 **FR** [4001]: March 11, 1967). Prior to 1930, San Joaquin kit foxes occupied much of the San Joaquin Valley. They occurred from as far north as San Joaquin County (west side) and Stanislaus County (east side), south to Kern County. By the 1930s, however, their range had been reduced to the southern and western portions of the Central Valley.

Kit fox surveys conducted between 1969 and 1975, extended the known range of the kit fox back into portions of its historic range in the northern San Joaquin Valley, including Contra Costa, Alameda, and San Joaquin counties. Additionally, kit foxes were found in three counties outside the originally defined historic range: Monterey, Santa Clara, and Santa Barbara.

The original range of the kit fox was estimated to encompass approximately 8,670 square miles, supporting anywhere between 8,670 and 12,135 adult foxes. By 1975, an estimated 42 percent of suitable habitat had been lost to development, particularly irrigated agriculture, with the kit fox population size estimated at 7,000 individuals (Service 1983). Most of the range defined in 1975 still supports kit foxes, although populations are declining, and populations in the northern portion of the species' range are small and potentially isolated.

Habitat Requirements and Reasons for Decline. San Joaquin kit foxes inhabit arid grasslands, seasonal wetlands, alkali desert scrub habitats, and valley foothill hardwood habitats. Prior to the rapid expansion of irrigated agriculture in the San Joaquin Valley, the alkali desert scrub association was probably the species' prime habitat.

Kit foxes are primarily nocturnal and carnivorous. Major prey includes kangaroo rats, black-tailed hares, desert cottontails, deer mice, and California ground squirrels. While kangaroo rats are a dominant prey item in the San Joaquin Valley (Service 1983),

California ground squirrels are the most important prey item in other portions of the kit fox's range. Kit foxes apparently do not require drinking water.

Kit fox home range sizes vary from 640 to 1,280 acres, with substantial overlap among individuals. The foxes usually inhabit areas with loose-textured soils suitable for den excavation (Service 1983). Where soils make digging difficult, the foxes frequently use and modify burrows excavated by ground squirrels and other burrowing animals. Structures such as culverts, abandoned pipelines, and well casings, may also be used as den sites.

San Joaquin kit foxes occupy many dens during their lifetime, and individuals will change den sites frequently in a season, especially in the summer. Morrell (1971) observed a family of kit foxes using at least 41 different den sites, over a 15-month period. Transient dens are used throughout the year, and may continue to be used until the prey base in the area is depleted, or until fleas become intolerable.

Pairs are formed during winter, with young being born in spring. Natal dens are used from December through May, with the same natal dens often used in subsequent years (Service 1983). The natal or pupping den entrances range from 2 to 18, with an average of 6, while transient dens typically have fewer openings. Natal or pupping dens are also distinguished by the presence of prey remains, scat, and extensive matted vegetation around their multiple entrances.

The San Joaquin kit fox population has declined primarily because of habitat loss to agricultural, urban, industrial, and oil and gas development in the San Joaquin Valley (Service 1983). In 1979, only 6.7 percent of the native habitats in the San Joaquin Valley south of Stanislaus County remained untilled or undeveloped.

Berry (1987) conducted studies of kit fox mortality in western Kern County from 1980 until 1986. Of 270 radio-collared animals, approximately 54 percent were killed by predators, 11 percent were killed by vehicles, 4 percent died of causes other than predation, and 31 percent died of unknown causes. Natural mortality factors include predation by coyotes, red foxes, golden eagles, and feral dogs, and starvation. Road kills, illegal shooting and trapping, and secondary poisoning and prey reduction from rodent control programs may be significant factors in the species' decline (Service 1983).

According to 1991 Kern NWR narratives (annual internal working documents containing biological data), a San Joaquin kit fox was observed along the west side of unit 14 in 1991. No subsequent observations occurred in this area. One individual was observed along the north end of Goose Lake Canal, both on and off the refuge. One incidental observation was made in 1991 near the refuge headquarters and another observation was made as a fox entered the southeast portion of the refuge. Potential use of units 2, 6B, 6C, 8, and 14 by foxes is likely to be limited to foraging or moving through the area.

According to the 1990 Pixley NWR narratives, a San Joaquin kit fox was documented at the refuge in 1985. A second observation occurred on the Deer Creek Unit during a night survey in 1989. San Joaquin kit foxes use the upland habitats located north and east of the 10 undeveloped wetland units that will be flooded during phase-three actions. Potential use of these undeveloped wetland units is likely to be limited to foraging events or movement through the area when units dry during the summer. Based on the Pixley NWR 1991 narratives, areas within the wetland unit appear to be occupied by coyotes.

Blunt-Nosed Leopard Lizard

Historical and Current Distribution: The blunt-nosed leopard lizard was listed on March 11, 1967 (32 FR 4001). The blunt-nosed leopard lizard once occurred throughout the San Joaquin Valley and surrounding plains and foothills (Montanucci 1967). Its historical range extended from San Joaquin County south to San Luis Obispo, Santa Barbara, and Ventura counties (CDFG 1980, Service 1988).

Agricultural, urban, and oil and gas development has resulted in extensive losses of habitat suitable for this lizard (Chesemore 1980, Stebbins 1954). Approximately 50 percent of the blunt-nosed leopard lizard's historical range had been lost by the late 1950's. O'Farrell and McCue (1981) estimated that approximately 7 percent of the San Joaquin Valley remained as potential habitat for blunt-nosed leopard lizards. Present populations are restricted to fragmented patches of native habitats in Merced, Madera, Fresno, Kings, Tulare, Kern, San Luis Obispo, and Santa Barbara counties.

Habitat Requirements and Reasons for Decline: Blunt-nosed leopard lizards occur from the valley floor up to 2,400 feet elevation in the surrounding foothills (Stebbins 1985). They inhabit sparsely vegetated grasslands, canyon floors, gently sloping hills, large washes, and alkali desert scrub habitats dominated by iodine bush and saltbush. Areas with native shrubs, and from 30 percent to 50 percent bare ground, provide optimum habitat for this species (Chesemore 1980).

The lizards prefer sandy soil but also occur in coarse, gravelly soil and hardpan areas (Montanucci 1967). Bare ground is preferred for courtship and escape, while shrub cover is needed for foraging and shade (Service 1985). Soils disturbed by plowing or discing typically support small and discontinuous populations of this species.

In optimal habitats, blunt-nosed leopard lizards typically occur at low densities, reaching densities of up to 1 lizard per acre (Tollestrup 1978). Higher densities of 24-50 lizards per 20-acre plot have been found on the Elkhorn Plain and Pixley NWR from 1989 through 1991. During drought periods, when herbaceous production and arthropod populations (especially grasshoppers) are low, adult blunt-nosed leopard lizards spend less time above ground and may not reproduce at all (Germano *et al.* 1994). Sustained periods of poor conditions would be expected to depress leopard lizard populations.

Likewise, other factors that have the potential to affect grasshopper numbers could similarly affect leopard lizard populations. Examples of such factors that may be operating in the San Joaquin Valley are cultivation, livestock grazing, and pesticide use. Cultivation and grazing reduce the availability of herbaceous material and pesticides can act directly to reduce grasshopper numbers. Foothill, plain, and disturbed habitats probably support substantially lower population densities than optimal lowland habitats (Service 1985). With the characteristic fluctuation in conditions in the San Joaquin Valley, even prime habitat will not always maintain leopard lizards at high density. Consequently, blunt-nosed leopard lizards may require fairly large areas of unaltered habitat to sustain reproductively viable populations (Chesemore 1980).

The lizards commonly use small mammal (e.g., kangaroo rat, ground squirrel, and gopher) burrows, and, in some areas, the abundance of the lizard may be correlated with the availability of burrows (Dorff 1981). The burrows are used for shade, escape, winter hibernation, and egg-laying. In areas where burrows are scarce, the lizards construct simple-chambered tunnels under exposed rocks or along banks of earth.

Timing of spring emergence from hibernation strongly depends on temperature, as does daily timing of activity. Individual lizards emerge from hibernation as early as late March, with most lizards active by mid-April. Courtship occurs from early May to mid-June, and egg-laying occurs from early June to mid-July. An average of two eggs are laid in a chamber excavated by the female lizards in the back of a rodent burrow. This species is most active during spring, and hibernation usually begins in October. These lizards are predatory; their diet includes insects and small vertebrates, including other lizards (Stebbins 1985).

The timing of daily emergence is strongly temperature-dependent. Generally, there are two periods of daily activity: morning and late afternoon. Most blunt-nosed leopard lizard surface activity takes place at air temperatures between 23.5°C and 40°C (74°F and 104°F), and at ground temperatures between 22°C and 36°C (74°F and 97°F). On cold mornings (i.e., below 23.5°C) the lizards may not be active, and if afternoon air temperatures exceed about 40°C, they may not emerge from their burrows until early evening. Some activity has been observed at temperatures as high as 50°C (122°F) (Service 1998).

Agricultural development and urbanization in the San Joaquin Valley have reduced the amount of native habitat available for blunt-nosed leopard lizards. Intensive livestock grazing may have contributed to the decline of this species by compacting soils, damaging rodent burrows, and denuding grasses and shrubs that support its prey base. Off-road vehicle use and oil and gas development may degrade and fragment the habitat. Rodent-control programs, which reduce the number of available small mammals, also reduce the availability of their burrows to the blunt-nosed leopard lizard.

Habitat losses for this species are continuing. For example, the 1980 Recovery Plan (Service 1980) reported that 176,604 acres of priority blunt-nosed leopard lizard habitat was available in 1977. By 1980, the remaining priority habitat had declined to 128,530 acres, and by 1985, habitat losses reduced that to 102,460 acres, only 58 percent of the habitat available in 1977. Unpublished maps prepared by the California Energy Commission (CEC), in 1991, indicated that habitat losses for this species are continuing (CEC 1991).

The 1991 Kern NWR narrative reported the range of the blunt-nosed leopard lizard was reduced due to the 1983-1984 flood when virtually all suitable habitat at Kern NWR was flooded. In 1991, sightings occurred in two areas. The first sighting occurred on the tour route along the east side of the refuge. The second sighting occurred in the Research Natural Area on the west side of the refuge.

According to the 1990 Pixley NWR narratives, several blunt-nosed leopard lizards occur in the Center Field, Two Well, and Deer Creek pastures. During May in 1989, 11 blunt-nosed leopard lizards were observed on the West Plot. Blunt-nosed leopard lizards use the upland habitats, located north and east of the 10 undeveloped wetland units, which will be flooded during phase-three actions. Blunt-nosed leopard lizards have not been found in the Turkey Tract Unit. The Turkey Tract Unit was flooded in 1983/1984, and was also flooded twice between 1993 and 1995.

Tipton Kangaroo Rat

Historical and Current Distribution: The Tipton kangaroo rat was listed as endangered on July 8, 1988 (53 **FR** 25611). The Tipton kangaroo rat was originally described as a subspecies of the widely distributed species *Dipodomys merriami* (Merriam 1884). Its taxonomy was later revised by Grinnell (1920, 1921), who regarded it as a subspecies of the Fresno kangaroo rat.

The Tipton kangaroo rat historically occurred in the Tulare Lake Basin, from Lemoore and Hanford in Kings County, to Tipton and Bakersfield on the east, and to the edge of the alkali desert scrub on the west (Uptain 1990; Williams 1985). The historical range of this subspecies encompassed approximately 1,716,500 acres (53 **FR** 25608).

In 1985, it was estimated that less than 4 percent (63,367 acres) of the Tipton kangaroo rat's habitat remained undeveloped, primarily in small blocks that were not large enough to support viable populations (Williams 1985). Presently, only 1 percent of the historical population may survive (CDFG 1992). Approximately 6,434 acres of remaining suitable habitat are preserved in five separate parcels (CDFG 1992). These areas are the federally administered Pixley NWR, the state-owned Allensworth Ecological Preserve, and the privately established Kern Water Bank and Coles Levee preserves, and The Nature Conservancy's (TNC) Paine Wildflower Preserve.

Habitat Requirements and Reasons for Decline: The Tipton kangaroo rat occurs in valley saltbush scrub and valley sink scrub habitats between 200- and 300-foot elevations in the Tulare Lake Basin (Williams 1985, CDFG 1992). Areas with friable soils are their preferred substrates to excavate shallow burrow systems. These systems are typically located on slightly elevated mounds, such as alluvial fans, or around the bases of shrubs, where wind-deposited soils have accumulated. The Tipton kangaroo rat's use of elevated sites for burrowing reduces the possibility of drowning during seasonal flooding (53 FR 25608).

The Tipton kangaroo rat feeds primarily on seeds and has an important role in seed dispersal; therefore, it can influence the local distribution of its food plants (53 FR 25608). This subspecies is preyed upon by carnivores such as American badgers, coyotes, and San Joaquin kit foxes. The Tipton kangaroo rat's burrow systems provide refuge to other animals, including blunt-nosed leopard lizards, and also serve to aerate soils and increase vegetative productivity (53 FR 25608).

Conversion of native habitats to agricultural production is considered the primary reason for the Tipton kangaroo rat's population decline (53 FR 25608). Construction of canals, roads, highways, railroads, and buildings, and the use of rodenticides has probably also accelerated this subspecies' population decline. Because of the small, isolated, nature of many remaining populations, their lack of genetic diversity, and low powers of dispersal, Tipton kangaroo rats are especially vulnerable to extinction from stochastic environmental events such as flooding or unpredictable land use changes.

Due to the 1983-1984 flood, it was believed that the Tipton kangaroo rat had been eliminated from Kern NWR. According to 1991 Refuge narratives, Tipton kangaroo rats were located during night trapping surveys. One Tipton kangaroo rat was located in unit eight during a trapping survey.

According to the 1990 Pixley NWR narratives, several Tipton kangaroo rats were located on the Deer Creek Unit. In a 1981 study at Pixley NWR, the estimated density was 5.9 rats per acre in the Deer Creek Unit. Tipton kangaroo rats use upland habitats located north and east of the 10 undeveloped wetland units that will be flooded during phase-three actions. Dense, continuous grassland vegetation exists at the Turkey Tract Unit. To date, Tipton kangaroo rats have not been found in this Unit.

Effects of the Proposed Action

Temporary Effects: Temporary effects occur when habitat components are temporarily removed, but can be restored to pre-project conditions of equal or greater habitat values. Projects are considered temporary for the giant garter snake if the project can be implemented, along with restoration, within 180 days. Projects are considered temporary

for upland species if the project can be implemented, along with restoration, within 2 years.

Permanent Effects: Permanent effects occur when habitat components are permanently removed. Projects are considered permanent for the giant garter snake if the project is implemented in excess of 180 days. Projects are considered permanent for upland species if the project is implemented in excess of 2 years.

Conveyance Project areas contain developed (highly modified) agricultural lands, vineyards, and small quantities of upland habitat for San Joaquin kit foxes, blunt-nosed leopard lizards, and Tipton kangaroo rats. Habitat effects to giant garter snake would mostly occur in and around existing canals. Table 1 identifies maximum acres affected in construction areas. Actual compensation would be dependent on compensation ratios for the species.

The temporary loss of up to 94.20 acres of giant garter snake upland habitat or aquatic habitat would be authorized within this opinion. Losses will be minimized by such actions as clearing only one side of a channel per year. The cumulative amount of up to 45.00 acres of temporary loss within upland habitat for the San Joaquin kit fox, blunt-nosed leopard lizard, or Tipton kangaroo rat, would be authorized within this opinion. Losses will be minimized by such actions as preferentially constructing in agricultural lands over native habitat. Habitat for blunt-nosed leopard lizard and Tipton kangaroo rat is also San Joaquin kit fox habitat. Consequently, impacts to the habitat of any or all of these species contributes to the cumulative temporary loss.

The permanent loss of up to 17.75 acres of giant garter snake upland habitat or aquatic habitat would be authorized within this opinion. The cumulative amount of up to 15.20 acres of permanent loss within upland habitat for the San Joaquin kit fox, blunt-nosed leopard lizard, or Tipton kangaroo rat, would be authorized within this opinion. Since habitat for blunt-nosed leopard lizard and Tipton kangaroo rat is also San Joaquin kit fox habitat, impacts to the habitat of any or all of these species contributes to the cumulative permanent loss.

Aquatic and Riparian Habitat Used by Giant Garter Snakes: Activities within the South San Joaquin Valley project area will not impact any habitat potentially utilized by giant garter snakes. Therefore, those activities will not be mentioned further in this section.

Canal enlargement activities in the Grasslands Area would result in short term effects to areas which could be used by giant garter snakes. Surface disturbance would occur at Conveyance Project areas when water siphons, turnouts, access roads, and pipelines were constructed. Most impacts would occur in previously disturbed canal areas within agricultural lands, or in areas that are intensively managed for waterfowl. Disturbance is expected to occur on 50.55 acres of altered canal habitats. Temporary habitat impacts

could occur within the Mosquito Ditch, Spillway Ditch, Santa Fe Canal, Main Canal, and Grassland Water District's San Luis Canal.

West Delta Canal and San Pedro Canal will also be modified. However, the intensive agricultural activity and the heavy canal maintenance (current and historic), preclude these areas from consideration as habitat. West Delta Canal will be cement lined for approximately 13,700 linear feet. This action could have some impact on the quality of giant garter snake habitat locally; although it is anticipated that the long-term habitat benefits reaped from this project (quantity and quality) will offset any negative impacts.

Construction activities in canals may remove vegetative cover and giant garter snake basking sites which are used for thermoregulation. Activities such as silt removal could fill or crush burrows or crevices, and remove the prey base. Because giant garter snakes use small mammal burrows and crevices as retreat sites, snakes may be crushed, buried, or otherwise injured from construction and maintenance actions in canals. Snakes may be run over by construction equipment or other vehicles accessing the construction sites. Therefore, some giant garter snake mortality could occur in Conveyance Project areas. The disturbance from construction activities may cause giant garter snakes to move into areas of unsuitable habitat where they will experience greater risk of predation or other sources of mortality. Silting, fill, or spilling oil or other chemicals could cause the loss of prey items on, or downstream of, the project sites. The construction of earthen dams may result in the loss of mammal burrows, retreat sites, or refugia.

For the major construction projects or modifications, effects on giant garter snakes will be minimized by conducting construction between April 30 and October 1, when snakes are active and better able to avoid areas of habitat disturbance. In addition, work crews will receive Service-approved environmental awareness training. This training will inform workers about the presence of giant garter snakes and habitat associated with the species and that unlawful take of the animal or destruction of its habitat is a violation of the Act. For the minor structural modifications, which may disturb habitat during the dormant period, effects will be minimized by having all excavation monitored by a qualified Service-approved biologist who can halt construction if a snake is encountered.

The installation of new turnout structures or weirs would result in temporary impacts to water quality because water turbidity would increase. Canals may be drained to conduct maintenance inspections. Therefore, water would not be available to giant garter snakes on a temporary basis (possibly up to 6 months) within some canals. Mortality is not anticipated as a direct result of these actions. However, snakes may experience higher predation and environmental stresses while attempting to access suitable habitat elsewhere.

All habitat temporarily impacted through the Conveyance Project will be restored to a pre-construction condition with equal or better habitat values. Permanent impacts will be

offset through habitat preservation, in accordance with the *Guidelines for Restoration and/or Replacement of Giant Garter Snake Habitat.* The conservation area for giant garter snakes would contain both upland and aquatic habitat components, at a ratio of 2 upland acres and 1 aquatic acre, for each acre impacted (3:1).

Upland Habitat Used by San Joaquin Kit Foxes, Blunt-nosed Leopard Lizards, and Tipton Kangaroo Rats: Impacts associated with clearing, grading, and excavating, will occur in areas where new conveyance facilities (canals) are constructed. These impacts could result in the permanent loss of habitat for the San Joaquin kit fox, blunt-nosed leopard lizard, and Tipton kangaroo rat. Impacts from installation of electrical lines would be short-term because vegetation would be re-seeded or become reestablished naturally in the project area. The anticipated width of impact for pipeline installation ranges from 150 to 200 feet. Large creek crossings, canals, and roads would require actions such as boring or siphon installation. Minor creeks would be crossed by constructing open trenches. Blunt-nosed leopard lizards or Tipton kangaroo rats could fall into open trenches, but could exit trenches by using escape ramps or pipes. Trapped animals could be subject to harm or mortality.

Tipton kangaroo rats and blunt-nosed leopard lizards may be subject to mortality in pipeline construction areas at Kern and Pixley NWR. Mortality could result from mechanical surface disturbing activities during pipeline construction or maintenance actions. Individual Tipton kangaroo rats or blunt-nosed leopard lizards may be harassed, injured or killed due to crushing or vehicle and equipment strikes during construction. These animals may be entombed if occupied burrows collapse. Animals displaced by the project may escape direct injury but may have to compete for food and living space with animals in adjacent areas. This may increase vulnerability of these animals to disease, predation, and accidental death due to increased stress and unfamiliarity with the new area. It is believed that no direct mortality of San Joaquin kit foxes will occur.

Upland habitat disturbance could occur at Pixley NWR areas where six water pumps may be installed. Pump placement should be done in a way that avoids endangered species habitat wherever possible. Pump installation is expected to disturb approximately 0.25 acre of land within the South San Joaquin Valley project area. If all of the wells are constructed, no more than 500 square feet of habitat would be permanently lost. Electrical distribution lines would result in temporary soil disturbance at pump stations and along conveyance pipelines. These activities would count toward the 5 acres of permanent and temporary habitat loss, respectively, as outlined in Table 1 - Minor Construction/Modifications, Weirs, etc.

Project related effects will occur from vegetation clearing and ground disturbance. Construction of siphons involves permanent impacts in areas where water structures are installed. Temporary impacts occur in equipment staging areas. Impacts to listed species will be minimal where pipelines are placed in existing road shoulders.

The PIX-2B alignment follows Deer Creek for approximately 2.5 miles along the southern border of Pixley NWR, and then continues for approximately 10.5 miles eastward to the Friant-Kern Canal. Installation of a pipeline along the alignment would create a temporary disturbance within the 20-foot corridor near Deer Creek. Vegetation near the alignment is influenced by agricultural practices and associated water diversions. The alignment is surrounded by crops along most of its length (i.e., there are small, isolated patches of habitat between agricultural areas, which could potentially support individuals of an endangered species). These crops consist of cotton, grapes, alfalfa, grain, and orchards. Temporary disturbance would occur on 30 acres of agricultural land along the 13-mile alignment.

Mendota Dam and Mendota Pool would be temporarily affected because of vegetation clearing and ground disturbance associated with construction activities. Constructing a new dam would involve permanent impacts in the construction area and temporary impacts in staging areas. Direct mortality of San Joaquin kit fox may occur during clearing and grading in construction rights-of-way, although minimization measures would likely prevent this from occurring. A permanent right-of-way would be maintained during operation of Mendota Dam. Maintenance activities such as tree removal would result in disturbance within the riparian corridor. There will be a permanent loss of 0.20 acres of upland habitat.

Although habitat loss will be avoided and minimized to the extent practicable, some endangered species habitat will be temporarily and permanently impacted. It is the intent of this project to increase endangered species habitat in the long-term within Conveyance Project areas. However, individuals may be displaced because of these relatively short-term habitat losses. This could result in lost breeding opportunities and increased competition, predation, exposure, and stress for a few individuals within each species. The displacement or taking of these individuals is not likely to impact population dynamics.

Upland habitat impacts will be avoided to the maximum extent practicable and follow the *Standard Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance*. All habitat temporarily impacted through the Conveyance Project will be restored to a pre-project condition with equal or better habitat values. Permanent impacts will be minimized through habitat preservation or compensation involving a 3:1 ratio (3 acres of preservation/compensation for each acre of impact).

No growth-inducing impacts are anticipated in Conveyance Project areas. Conveyance Project actions are designed to improve wildlife habitat, which will provide open space values in perpetuity. None of the proposed actions would foster measurable population growth or the construction of additional housing in nearby communities. No cumulative effects are anticipated within communities located adjacent to Conveyance Project construction sites. Conveyance Project activity would result in increased recreational

opportunities at refuges and wildlife areas. This could result in increased human disturbance to endangered species and the habitat upon which they depend. However, the long-term benefits associated with perpetual open space, far outweigh the minor increases in hunting and tourism pressures. Economic activity could increase in the community due to a greater demand for lodging by hunters and tourists.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

An undetermined number of future land-use conversions and routine agricultural practices are not subject to Federal permitting processes. These may alter habitat or increase incidental take of the species in this biological opinion, and are therefore, cumulative to the proposed project. These additional cumulative effects include: (1) unpredictable fluctuations in aquatic habitat due to water management; (2) dredging and clearing vegetation for construction of irrigation canals and dams; (3) discing or mowing upland habitat; (4) increased vehicular traffic on access roads adjacent to aquatic habitat; (5) use of burrow fumigants on levees and other potential upland refugia; and (6) human intrusion into aquatic, riparian, and upland habitats. Specific cumulative effects can include operations and maintenance activities on canals and pipelines.

Conclusion

After reviewing the current status of the San Joaquin kit fox, blunt-nosed leopard lizard, Tipton kangaroo rat, and giant garter snake, the environmental baseline for the action areas, and the direct, indirect, and cumulative effects of the proposed Conveyance Project, it is the Service's biological opinion that the Conveyance Project, as proposed, is not likely to jeopardize the continued existence of the San Joaquin kit fox, blunt-nosed leopard lizard, Tipton kangaroo rat, or giant garter snake. No critical habitat has been designated for these species, therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act, and Federal regulation pursuant to section 4(d) of the Act, prohibit take of endangered and threatened species, respectively, without a special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral

patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

The measures described below for the San Joaquin kit fox, blunt-nosed leopard lizard, Tipton kangaroo rat, and giant garter snake are non-discretionary. These measures must be implemented by Reclamation so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. Reclamation has a continuing duty to regulate the activity covered by this incidental take statement. If Reclamation fails to adhere to the terms and conditions of the incidental take statement, or fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Amount or Extent of Take

The Service anticipates that incidental take of San Joaquin kit foxes, blunt-nosed leopard lizards, Tipton kangaroo rats, and giant garter snakes may occur through harassment, harm, and/or mortality. Blunt-nosed leopard lizards, Tipton kangaroo rats, and giant garter snakes are secretive species. These species are difficult to detect and observe in their habitats. Close-range observations are rare. It is unlikely that San Joaquin kit fox mortality will occur because of implementation of avoidance measures (*Standard Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance)*. Estimating the number of San Joaquin kit foxes, blunt-nosed leopard lizards, Tipton kangaroo rats, and giant garter snakes that could be harassed, harmed, and/or killed during construction, operation, and maintenance of the proposed facilities is difficult. However, due to the implementation of the avoidance and minimization measures for these species, it is assumed that some, but not all, of the individuals inhabiting these areas may be subject to take.

In areas where take is difficult to detect, the Service estimates take in terms of the amount of habitat lost (acres) as a result of the action. The Service anticipates that giant garter snakes could be incidentally harassed, harmed, or killed when construction or maintenance actions are conducted. A maximum of 35.50 acres of giant garter snake upland habitat would not be used by giant garter snakes if 17.75 acres of aquatic habitat is permanently disturbed (ratio of 1 acre aquatic to 2 acres upland). A maximum of 188.40 acres of giant garter snake upland habitat may not be used temporarily by giant garter snakes if 94.20 acres of aquatic habitat is temporarily disturbed. A total of 111.95

acres of giant garter snake habitat could be temporarily or permanently disturbed (94.20 + 17.75 = 111.95).

Incidental take of San Joaquin kit foxes, blunt-nosed leopard lizards, and Tipton kangaroo rats is identified in terms of acres of disturbance. A maximum of 15.20 acres of upland habitat could be permanently disturbed. A maximum of 45.00 acres of upland habitat could be temporarily disturbed. Consequently, a maximum of 60.20 acres of temporary or permanent habitat disturbance could occur within San Joaquin kit fox, blunt-nosed leopard lizard, and/or Tipton kangaroo rat habitats. It is important to remember that disturbing San Joaquin kit fox habitat would also disturb blunt-nosed leopard lizard and/or Tipton kangaroo rat habitat. Therefore, habitat impacts to each of these species contribute to the cumulative disturbance allowed under this opinion.

Effect of the Take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to giant garter snake, San Joaquin kit fox, blunt-nosed leopard lizard, or Tipton kangaroo rat, or destruction or adverse modification of critical habitat.

Reasonable and Prudent Measures

The following reasonable and prudent measures are necessary and appropriate to minimize incidental take of giant garter snakes, San Joaquin kit foxes, blunt-nosed leopard lizards, and Tipton kangaroo rats.

1. Harassment, harm, or mortality of giant garter snakes due to construction and operations associated with implementing the project shall be minimized.

2. Harassment, harm, or mortality of San Joaquin kit foxes, blunt-nosed leopard lizards, and Tipton kangaroo rats due to construction and operations associated with implementing the project shall be minimized.

Terms and Conditions

To be exempt from the prohibitions of section 9 of the Act, Reclamation must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

1A. Harassment, harm, or mortality of giant garter snakes due to construction and operations associated with implementing the project shall be minimized (refer also to the attached *Standard Avoidance and Minimization Measures During Construction Activities in Giant Garter Snake Habitat.*)

1. For the major structural projects, all construction activity within giant garter snake habitat shall be conducted between April 30 and October 1. This is the active period for giant garter snakes and direct impacts are lessened because snakes are actively moving and avoiding danger. More danger is posed to snakes during their inactive period because they occupy underground burrows or crevices and are more susceptible to direct effects, especially during excavation. Between October 2 and April 29, contact the SFWO to determine if additional measures are necessary to avoid and minimize take. Minor structural projects can take place between October 2 and April 29, when necessary, if a Service-approved biologist is present on-site to detect any snakes or burrows within the impact area. If giant garter snakes are encountered, the Service-approved biologist has the authority to stop construction until the giant garter snake has moved, of its own accord, out of the construction zone.

2. Any dewatered habitat must remain dry for at least 15 consecutive days prior to excavating or filling of the dewatered habitat.

3. Within 24 hours, prior to commencement of construction activities, the site shall be inspected by a Service-approved biologist. The biologist shall provide the Service with a field report form documenting the monitoring efforts within 24 hours of commencement of construction activities. The monitoring biologist must be available thereafter during construction. If a snake is encountered during construction activities, the monitoring biologist shall have the authority to stop construction activities until appropriate corrective measures have been completed or it is determined that the snake will not be harmed. Giant garter snakes encountered during construction activities should be allowed to move away from construction activities on their own. Capture and relocation of trapped or injured individuals shall be conducted according to directions provided by the Service. If snakes are injured, the monitoring biologist shall contact the Service to locate an approved treatment facility. The project area shall be re-inspected whenever a lapse in construction activity of 2 weeks or greater has occurred.

4. Clearing of wetland vegetation will be confined to the minimal area necessary for canal enlargement or maintenance, installation of rip rap, or installation of fill material.

1B. Harassment, harm, or mortality of giant garter snakes due to temporary or permanent loss of habitat shall be minimized. Temporarily disturbed habitat shall be restored to a level of quality that is equal to, or better than, the pre-project condition. The impacts to giant garter snakes due to permanent loss of habitat shall be minimized through habitat preservation at a 3:1 replacement ratio.

1. Any temporarily disturbed areas shall be restored in a manner consistent with the attached *Guidelines for Restoration and/or Replacement of Giant Garter Snake Habitat*.

2. Minimization through habitat preservation shall meet the criteria listed in the attached *Guidelines for Restoration and/or Replacement of Giant Garter Snake Habitat*. The preserved habitat shall include both upland and aquatic habitat components, at a ratio of 2 acres of upland habitat to each acre of aquatic habitat. The preservation site shall be subject to Service approval. On-site habitat creation can be counted toward the preservation requirement, at the Service's discretion, if it can be demonstrated that the habitat will be successfully created, will have long-term value for the giant garter snake, and will be preserved in perpetuity.

2A. Harassment, harm, or mortality of San Joaquin kit foxes, blunt-nosed leopard lizards, and Tipton kangaroo rats due to construction and operations associated with implementing the project shall be minimized.

1. Minimization through habitat preservation shall be "in-kind" when habitat is secured for San Joaquin kit fox, blunt-nosed leopard lizard, and Tipton kangaroo rat (e.g., blunt-nosed leopard lizard habitat will be replaced with habitat of equal or better value to blunt-nosed leopard lizards). An agency, conservation organization, or other private entity shall be designated as the long-term manager when the conservation parcels are secured.

2B. Harassment, harm, or mortality of San Joaquin kit fox, blunt-nosed leopard lizard, and Tipton kangaroo rat, due to temporary or permanent loss of habitat, shall be minimized. Temporarily disturbed habitat shall be restored to a level of quality that is equal to, or better than, the pre-project condition. Permanent habitat loss shall be minimized through habitat preservation at a 3:1 replacement ratio.

1. Permanent habitat loss shall be minimized through habitat preservation at a 3:1 replacement ratio. The preservation site shall be subject to Service approval. On-site habitat creation can be counted toward the preservation requirement, at the Service's discretion, if it can be demonstrated that the habitat will be successfully created, will have long-term value for the San

Joaquin kit fox, blunt-nosed-leopard lizard, and Tipton kangaroo rat, and will be preserved in perpetuity.

2. Pixley NWR's biological monitor will be on-site at Pixley NWR during any preconstruction surveys for water pump placement. This monitor will be consulted to avoid habitat for the above species to the maximum extent practicable. If pumps, and their associated electrical distribution lines, cannot avoid listed species habitat, the monitor will ensure no accidental entrapment of individuals occurs.

3. The following terms and conditions are common to Reasonable and Prudent Measures #1 and #2.

A. Construction personnel shall participate in a Service-approved worker environmental awareness program. Under this program, workers shall be informed about the presence of giant garter snakes, San Joaquin kit foxes, blunt-nosed leopard lizards, and Tipton kangaroo rats, and habitat associated with these species, and that unlawful take of the animals or destruction of their habitat is a violation of the Act. Prior to construction activities, a qualified, Service-approved biologist, shall instruct all construction personnel about (1) the life history of the four above-mentioned listed species; (2) the importance of: (a) irrigation canals, marshes/wetlands, and seasonally flooded areas, to the giant garter snake; and (b) upland habitat that could support San Joaquin kit fox, blunt-nosed leopard lizard, and Tipton kangaroo rat; and (3) the terms and conditions of this biological opinion. Proof of this instruction shall be submitted to the SFWO within 2 weeks after construction has commenced at each site.

B. Reclamation shall appoint a Service-approved monitoring biologist who shall be the contact source for any employee or contractor who might incidentally take a listed species, or who finds a dead, injured, or entrapped listed species. The representative shall be identified when listed species education programs are conducted.

C. Any spills of hazardous materials within endangered species habitats shall be cleaned up immediately. Such spills shall be reported in post-construction compliance reports.

D. Movement of heavy equipment to and from each construction site shall be conducted on established roadways or non-habitat areas where impacts to endangered species can be avoided.

E. Outside perimeters of construction areas shall be prominently flagged or demarcated by appropriate means to maintain activities inside designated areas. All flagging shall be removed upon conclusion of construction.

F. Habitat disturbance shall be confined to the minimal area necessary for completing each activity associated with the Conveyance Project. When construction has been completed at each site, the exact acreage of temporary and permanent habitat loss shall be quantified and reported to the SFWO.

G. After completion of construction activities, any temporary fill and construction debris shall be removed and any temporarily disturbed areas shall be restored to pre-project conditions of equal or better habitat values. Any revegetation plans shall use native plants or clean native seed stock when restoration work is conducted. To remain consistent with the intent of the Conveyance Project, use of nonnative seed stock will not be an acceptable option.

H. If requested, upon completion of construction activities, personnel of the Kern/Pixley NWR, San Luis NWR, Mendota WA, or the enhancement contractor shall accompany Service personnel for an on-site inspection of the sites to review project impacts to endangered species and their habitats.

I. All aquatic and upland conservation areas provided for the giant garter snake, San Joaquin kit fox, blunt-nosed leopard lizard, and Tipton kangaroo rat shall be protected in perpetuity by a Service-approved conservation easement or similarly protective covenants in the deed. Conservation parcels shall be located in the county where construction occurs. Alternatively, the latter three upland species may have conservation parcels located in geographic areas identified in the Service's Recovery Plan for Upland Species, San Joaquin Valley. The conservation easement or deed restriction shall be recorded at the county recording office within 6 months of ground breaking for major projects. The easement/deed shall be provided to the Service within 30 days after recordation. Standard examples of conservation easements and deed restrictions are available from the Service upon request.

J. Annual report of activities: Within 6 months after completion of annual construction activity, Kern and Pixley NWR's, San Luis NWR, and Mendota WA shall submit to the SFWO a post-activity report that describes: (1) dates the pre-construction surveys took place; (2) dates that construction occurred; (3) pertinent data concerning success in meeting project minimization measures; if any; (4)

known project effects on listed species, if any; and (5) occurrences of incidental take of federally listed species, if any.

K. The SFWO shall be notified in writing within three (3) working days of the accidental death or injury of any of the above-listed species, or of the finding of any dead or injured endangered or threatened species. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal plus any other pertinent information. The Service contacts for this information are the Field Supervisor or Division Chief for Endangered Species, of the Sacramento Fish and Wildlife Office (916/979-2725). Any dead or injured giant garter snake, San Joaquin kit fox, Tipton kangaroo rat, or blunt-nosed leopard lizard, or other listed species must be relinquished to the CDFG, Environmental Services Division, for care or analysis. The Department contact number at the Fresno Regional Headquarters is (559) 243-4005.

Reporting Requirements

The Service-approved monitoring biologist shall notify the Service immediately if giant garter snakes, San Joaquin kit foxes, blunt-nosed leopard lizards, or Tipton kangaroo rats are found on site. Reclamation will submit an annual report including date(s), location(s), habitat description, and any corrective measures taken to protect the listed species that are found. The biologist shall submit locality information to the Department's Natural Diversity Data Base on Native Species Field Survey Forms no more than 90 calendar days after completing the last field visit at the project site. Each form shall have an accompanying map of the site, such as a photocopy of a portion of the 7.5 minute U.S. Geological Survey map, and shall provide at least the following information: (1) township, range, and quarter section; (2) name of the 7.5' or 15' quadrangle, (3) dates of field work; (4) number of individuals encountered; and (5) a description of the habitat by community-vegetation type.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities which can be implemented to further the purposes of the Act, such as preservation of endangered species habitat, implementation of recovery actions, or development of information and data bases.

1. As a Recovery Plan for the giant garter snake is developed, Reclamation should assist the Service with its implementation. Reclamation should assist the Service in implementing the final Recovery Plan for Upland Species of the San Joaquin Valley, California.

2. Reclamation should incorporate into bidding documents the attached *Standard Avoidance and Minimization Measures for Construction Activities in Giant Garter Snake Habitat*, and *Standard Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance* when appropriate.

3. Reclamation, in partnership with the Service, should use Central Valley Project Operations and Maintenance Plan guidelines (December 1, 1997) for Reclamation projects. Implementation of these guidelines will help reduce adverse effects of routine operations and maintenance on giant garter snakes, San Joaquin kit foxes, blunt-nosed leopard lizards, Tipton kangaroo rats, and their habitat.

4. Land acquisition at National Wildlife Refuges and State Wildlife Areas should continue to provide additional habitat for the endangered giant garter snake, San Joaquin kit fox, blunt-nosed leopard lizard, and Tipton kangaroo rat. Habitat acquisition should receive priority attention with on-going NWR comprehensive conservation planning. Additional surveys for listed or candidate plants should be conducted in an effort to prioritize future acquisition of refuge lands, conservation easements, or protective measures that are within the mission of the National Wildlife Refuge System.

For the Service to be kept informed of actions minimizing or avoiding adverse effects, or benefitting listed species or their habitats, the Service requests notification with regard to implementing any conservation recommendations.

REINITIATION--CLOSING STATEMENT

This concludes formal consultation on the Conveyance Project as outlined in the request. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained or is authorized by law, and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat is designated that may be affected by this action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must

cease pending reinitiation. In addition, if Reclamation discovers that the conditions of any

permit have not been followed, Reclamation should review its responsibilities under section 7 of the Act and reinitiate formal consultation with the Service.

If you have any questions regarding this biological opinion, please contact Frank Muth or Peter Cross of my staff at (916) 979-2728.

Sincerely,

Wayne S. White
Field Supervisor

Attachments (3): *Standard Avoidance and Minimization Measures During Construction Activities in Giant Garter Snake Habitat.*

Guidelines for Restoration and/or Replacement of Giant Garter Snake Habitat

Standard Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance

cc: FWS, CNO, Sacramento, CA
FWS, Joel Miller, Sacramento, CA
FWS, Kern-Pixley NWR, Delano, CA
FWS, San Luis NWR, Los Banos, CA
FWS, Wetlands Branch, Sacramento, CA
FWS, Dave Paullin, Sacramento, CA
BOR, Mona Jefferies-Soniea, Sacramento, CA
BOR, Russ Grimes, Fresno, CA
BOR, Frank Michny, Sacramento, CA
BOR, Stan Yarburough, Sacramento, CA
DWR, Earle Cummings, Sacramento, CA
CDFG, Jerry Mensch, Sacramento, CA
CDFG, John Beam, Los Banos, CA
CDFG, Regional Manager, G. Nokes, Fresno, CA
GWD, Dean Kwasny, Los Banos, CA
CH2MHILL, Kathy Freas, Sacramento, CA

San Luis Canal Company, Bob Capehart Dos Palos, CA
CCID, Mike Porter, Los Banos, CA
DU, Holly Andree, Rancho Cordova, CA
CWA, Bill Gaines, Sacramento, CA
BVWSD, Martin Milobar, Buttonwillow, CA

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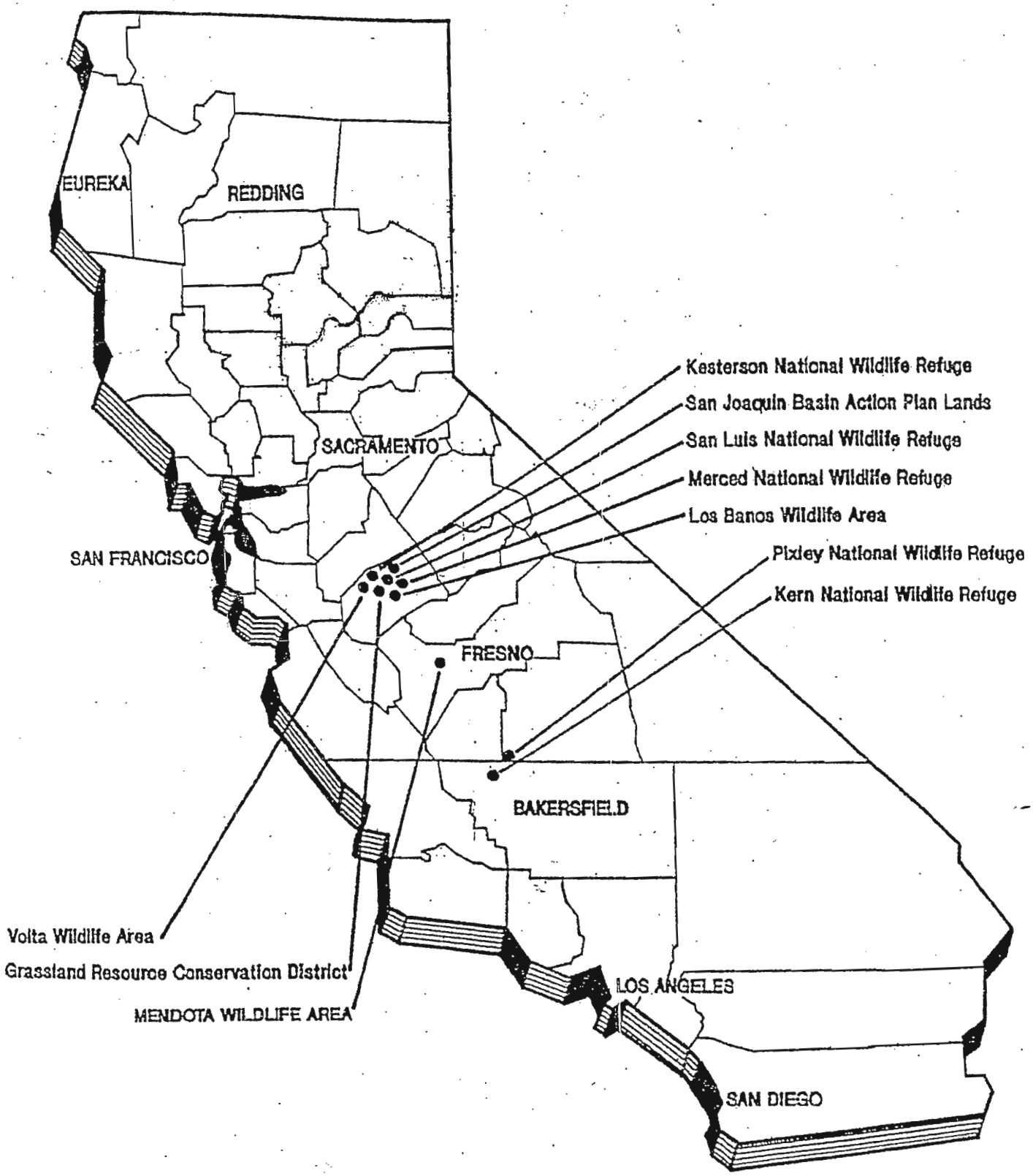

Wildlife refuge areas identified in the Central Valley Project Improvement Act.

Standard Avoidance and Minimization Measures During Construction Activities in Giant Garter Snake Habitat

GIANT GARTER SNAKE
(*Thamnophis gigas*)

HABITAT TYPE:

Marshes, sloughs, ponds, small lakes, low gradient streams, irrigation and drainage canals, and rice fields. Permanent aquatic habitat, or seasonally flooded during the snake's active season (early-spring through mid-fall), with herbaceous wetland vegetation, such as cattails and bulrushes, grassy banks (often salt grass), and uplands for cover and retreat sites during the snake's active season and for refuge from flood waters during the dormant season (winter). Giant garter snakes are typically absent from larger rivers and other water bodies that support introduced populations of large, predatory fish, and from wetlands with sand, gravel, or rock substrates. Riparian woodlands typically do not provide suitable habitat because of excessive shade, lack of basking sites, and absence of giant garter snake prey.

AVOIDANCE AND MINIMIZATION MEASURES:

Avoid construction activities within 200 feet from the banks of giant garter snake aquatic habitat. Confine movement of heavy equipment to existing roadways to minimize habitat disturbance.

Construction activity within habitat should be conducted between May 1 and October 1. This is the active period for giant garter snakes and direct mortality is lessened, because snakes are expected to actively move and avoid danger. Between October 2 and April 30 contact the Service's Sacramento Fish and Wildlife Office to determine if additional measures are necessary to minimize and avoid take.

Confine clearing to the minimal area necessary to facilitate construction activities. Flag and designate avoided giant garter snake habitat within or adjacent to the project area as Environmentally Sensitive Areas. This area should be avoided by all construction personnel.

Construction personnel should receive Service-approved worker environmental awareness training. This training instructs workers to recognize giant garter snakes and their habitat(s).

24-hours prior to construction activities, the project area should be surveyed for giant garter snakes. Survey of the project area should be repeated if a lapse in construction activity of two weeks or greater has occurred. If a snake is encountered during construction, activities shall cease until appropriate corrective measures have been

completed or it has been determined that the snake will not be harmed. Report any sightings and any incidental take to the Service immediately by telephone at (916) 979-2725.

Any dewatered habitat should remain dry for at least 15 consecutive days after April 15 and prior to excavating or filling of the dewatered habitat.

After completion of construction activities, remove any temporary fill and construction debris and, wherever feasible, restore disturbed areas to pre-project conditions. Restoration work may include such activities as replanting species removed from banks or replanting emergent vegetation in the active channel.

Compensate loss and disturbance of giant garter snake habitat according to Table 1. Mitigation ratios are based on the acreage and on the duration of disturbance.

TABLE 1 - SUMMARY OF GIANT GARTER SNAKE PROGRAMMATIC MITIGATION LEVELS

	IMPACTS: DURATION	**IMPACTS:** ACRES	**MITIGATION:** COMPENSATION
LEVEL 1	1 season	Less than 20 and temporary	Restoration
LEVEL 2	2 seasons	Less than 20 and temporary	Restoration plus 1:1 replacement
LEVEL 3	More than 2 seasons and temporary Permanent loss	Less than 20 and temporary Less than 3 acres total giant garter snake habitat AND Less than 1 acre aquatic habitat; OR Less than 218 linear feet bank habitat	3:1 Replacement (or restoration plus 2:1 replacement) 3:1 Replacement

Giant garter snake habitat includes 2.0 acres of surrounding upland habitat for every 1.0 acre of aquatic habitat. The 2.0 acres of upland habitat also may be defined as 218 linear feet of bankside habitat which incorporates adjacent uplands to a width of 200

feet from the edge of each bank. Each acre of created aquatic habitat should be supported by two acres of surrounding upland habitat. Compensation may include creating upland refuges and hibernacula for the giant garter snake that are above the 100-year flood plain.

A season is defined as the calendar year period between May 1 and October 1, the active period for giant garter snake when mortality is less likely to occur.

Information to Include in a Project Monitoring Report for Giant Garter Snake

1. Date

2. Surveyor

3. Project information (should include the following):
    a. Project name
    b. Location
    c. Project impacts and acres impacted

4. Survey information (should include the following):
    a. Time of day
    b. Temperature at start and end of survey. Include ambient temperature, temperature at ground level, and at approximately 3 inches above ground level.
    c. Weather conditions (include wind conditions and cloud cover)
    d. Acres/area surveyed

5. Site description (may include the following):
    a. Habitat types present, substrate/soils, etc.
    b. Topography/elevation
    c. Surrounding land-use/activity
    d. Description of project features

6. Habitat characteristics:
    a. Burrows/potential hibernacula present? (Y/N)
    b. Amount and type of cover present, including upland and emergent vegetation
    c. Prey species present? (Y/N)
    d. Distance to nearest available habitat
    e. Other species observed

7. Giant garter snakes present? (Y/N) If observed provide the following information:
    a. Number of individuals, and if possible to determine, whether juveniles or adults
    b. Location(s)
    c. Describe behavior and activity
    d. Describe protective measures implemented

8. Describe on site mitigation and avoidance measures implemented (fencing, dewatering, worker awareness training, etc.). Include any difficulties implementing measures and corrective measures taken.

Report all sightings to the US Fish and Wildlife Service, Sacramento Fish and Wildlife Office at (916) 979-2725, and to the California Department of Fish and Game (CDFG). The monitoring biologist must submit all sightings to CDFG Natural Diversity Data Base (NDDB) using a California Native Species Field Survey Form and provide copies to CDFG and the Service .

Appendix A

Guidelines for Restoration and/or Replacement of Giant Garter Snake Habitat

Replacement and Restoration Guidelines are provided together, as the two conservation measures may not be mutually exclusive. Replacement of habitat may also require restoration of some areas. Preserved habitat may additionally be improved for giant garter snake by using some of the restoration guidelines.

Reference sites

A nearby reference site should be chosen both for restoration of giant garter snake habitat and for creation of replacement habitat. The reference site will be used to determine the success of conservation efforts. For restoration of habitat, the pre-project condition may be used as a reference site if adequate documentation exists. For creation of replacement habitat or for restoration where pre-project conditions are not documented, the reference site should be nearby or adjacent and should represent high quality giant garter snake habitat.

Restoration of giant garter snake habitat

Restoration may include incorporating some of the Replacement guidelines to enhance habitat value for giant garter snake. Restoration should follow the guidelines outlined below:

1. Restoring giant garter snake habitat includes minimizing impacts of project activities to the existing habitat, including using silt fencing, designating environmentally sensitive areas, using protective mats, preventing runoff, and providing worker awareness training. Measures to minimize impacts include:

    a. Avoid construction activities within 200 feet from the banks of giant garter snake aquatic habitat. Confine movement of heavy equipment to existing roadways to minimize habitat disturbance.

    b. Construction activity within habitat should be conducted between May 1 and October 1. This is the active period for giant garter snakes and direct mortality is lessened, because snakes are expected to actively move and avoid danger. Between October 2 and April 30 contact the Service's Sacramento Fish and Wildlife Office to determine if additional measures are necessary to minimize and avoid take.

    c. Confine clearing to the minimal area necessary to facilitate construction activities. Flag and designate avoided giant garter snake habitat within or adjacent to the project area as Environmentally Sensitive Areas. This area should be avoided by all construction personnel.

d. Construction personnel should receive Service-approved worker environmental awareness training. This training instructs workers to recognize giant garter snakes and its habitat(s).

e. 24-hours prior to construction activities, the project area should be surveyed for giant garter snakes. Survey of the project area should be repeated if a lapse in construction activity of two weeks or greater has occurred. If a snake is encountered during construction, activities shall cease until appropriate corrective measures have been completed or it has been determined that the snake will not be harmed. Report any sightings and any incidental take to the Service immediately by telephone at (916) 979-2725.

f. Any dewatered habitat should remain dry for at least 15 consecutive days after April 15 and prior to excavating or filling of the dewatered habitat.

2. Remove all construction debris and stockpiled materials.

3. Regrade area to preexisting contour, or a contour that would improve restoration potential of the site.

4. Replant and hydroseed the restoration area. Recommended plantings consist of a) wetland emergents, b) low-growing cover on or adjacent to banks, and c) upland plantings/hydroseeding mix to encourage use by other wildlife. Riparian plantings are not appropriate because shading may result in lack of basking sites. Native plantings are encouraged except where non-natives will provide additional values to wildlife habitat and will not become invasive in native communities. The applicant should obtain cuttings, plantings, plugs, or seeds, from local sources wherever possible. The applicant should attempt to restore conditions similar to that of adjacent or nearby habitats.

a. Emergent wetland plants recommended for giant garter snake habitat are California bulrush (*Scirpus californicus*), cattail (*Typha* spp.), and water primrose (*Ludwigia peploides*). Additional wetland plantings may include common tule (*Scirpus acutus*), Baltic rush (*Juncus balticus*), or duckweed (*Lemna* spp.).

b. Cover species on or adjacent to the bank may include California blackberry (*Rubus vitifolius*) or wild grape (*Vitis californica*), along with the hydroseeding mix recommended below.

c. Upland plantings/hydroseeding mix: Disturbed soil surfaces such as the levee slopes should be hydroseeded to prevent erosion. The Service recommends a mix of 20-40 percent native grass seeds [such as annual fescue (*Vulpia* spp.), California brome (*Bromus carinatus*), wild rye (*Elymus glaucus*), and needle grass (*Nasella*

spp.)], 2-10 percent native forb seeds, five percent rose clover (*Trifolium hirtum*), and five percent alfalfa (*Medicago sativa*). Approximately 40-68 percent of the mixture may be non-aggressive European annual grasses [such as wild oats (*Avena sativa*), wheat (*Triticum* ssp.), and barley (*Hordeum vulgare*)]. The Corps will not include aggressive non-native grasses, such as perennial ryegrass (*Lolium perenne*), cheatgrass (*Bromus tectorum*), fescue (*Festuca* spp.), giant reed (*Arundo donax*), medusa-head (*Taeniatherum caput-medusae*), or Pampas grass (*Cortaderia selloana*) in the hydroseed mix. The Corps will not include endophyte-infected grasses in the mix. One-hundred percent native grass and forb mixes may also be used.

Replacement of giant garter snake habitat

Location

Replacement location should be within the same population cluster boundaries (population clusters are defined in 58 FR 54053) as the habitat lost. For example: The boundaries of the Sacramento Basin population cluster are approximately, Highway 16 to the north, Sacramento River to the west, Twin Cities Road to the south, and the Folsom Aqueduct to the east. Habitat lost within this area must also be replaced within this area.

Habitat components

Giant Garter Snake Habitat. The giant garter snake inhabits marshes, sloughs, ponds, small lakes, low gradient streams, other waterways and agricultural wetlands such as irrigation and drainage canals and rice fields, and the adjacent uplands. Essential habitat components consist of (1) adequate water during the snake's active period, (early spring through mid-fall) to provide a prey base and cover; (2) emergent, herbaceous wetland vegetation, such as cattails and bulrushes, for escape cover and foraging habitat; (3) upland habitat for basking, cover, and retreat sites; and (4) higher elevation uplands for cover and refuge from flood waters. For the purposes of this programmatic opinion, a basic giant garter snake habitat unit will incorporate 2.00 acres (0.81 hectares) of surrounding upland for every 1.00 acre (0.40 hectare) of aquatic habitat. The 2.00 acres (0.81 hectares) of upland also may be defined as 218 linear feet (66 meters) of bankside habitat which incorporates adjacent uplands to a width of 200 feet (61 meters) from the edge of the bank.

Replacement habitat must provide the above mentioned essential habitat components and include the following:

1. All replacement habitat must include both upland and aquatic habitat components. Upland and aquatic habitat components must be included in the replacement habitat at a ratio of 2:1 upland acres to aquatic acres

2. A semi-permanent or permanent aquatic habitat which provides water during the active period for giant garter snakes (April through October) with suitable vegetative cover present. Linear or meandering channels with slow flowing water over mud or silt substrate are preferred.

3. Upland basking and retreat sites with low growing vegetation cover adjacent to aquatic habitat, and upland retreats and flood refugia with partially buried broken concrete or animal burrows.

4. Small fish and amphibian larvae for foraging, but predatory "gamefish" (bass, *Micropterus* spp.; sunfish, *Lepomis* spp.; catfish, *Ictalurus* spp. and *Ameirus* spp.) absent or controlled.

5. An adequate buffer (at least 200 feet) from roadways to reduce vehicular mortality.

6. Follow planting recommendation provided above under restoration guidelines.

Monitoring

Habitat restoration

Restoration of habitat should be monitored for one year following implementation. Monitoring reports documenting the restoration effort should be submitted to the Service: (1) upon completion of the restoration implementation; and (2) one year from restoration implementation. Monitoring reports should include photodocumentation, when restoration was completed, what materials were used, plantings (if specified) and justification of any substitutions to the Service recommended guidelines. Monitoring reports should also include recommendations for remedial actions and approval from the Service, if necessary, and justification from release of any further monitoring, if requested.

Creation of replacement habitat

Replacement habitat should be monitored for 5 years following implementation. Hydrology should be monitored for the first two years after creation of wetlands. The monitoring effort should continue for three additional years to ensure success criteria are met. Monitoring reports documenting implementation of conservation measures should be submitted to the Service: (1) upon completion of wetland creation; (2) yearly for the first two years of monitoring; and (3) 5 years from implementation. Monitoring reports should include photodocumentation, when restoration was completed, what materials were used, plantings (if specified) and justification of any substitutions to the Service recommended guidelines. Monitoring reports should also include recommendations for remedial actions and approval from the Service, if necessary, and justification from release of any further monitoring, if requested.

Success criteria for replacement habitat:

Appendix A

1. At completion of monitoring, the cover measured on the habitat area should be 90 percent of cover measured on the reference site.

2. At completion of monitoring, the species composition measured on the habitat area should be 90 percent of that measured on the reference site.

3. At completion of monitoring, wetlands created on the site should meet Corps jurisdictional criteria.

Maintenance and management of replacement giant garter snake habitat

1. A final management plan of replacement habitat must be approved by the Service.

2. All maintenance activities should follow Standard Avoidance and Minimization Measures During Construction Activities in Giant Garter Snake Habitat.

3. Additional guidance includes:

   a. Canal Maintenance - Hand clearing of canals is preferred for removal of excessive vegetation or debris. Any equipment should be operated from the bank top. Excavate from only one side of the canal during a given year. Avoid excavating the banks above the high water level. Preferably, one side of the canal should be left undisturbed indefinitely (the prefered side would be the west or north side) so that emergent vegetation and bank side cover is left in place.

   b. Place the spoils from canal clearing in a designated location, rather than along bank tops. This will prevent burying or crushing snakes basking on the banks, or trapping snakes taking cover in burrows or bank-top soil crevices.

   c. Vegetation control - Uplands should not be disced. Leave vegetation on levees and canal sides wherever possible. Mowing to control vegetation should take place July through September and mower blades should be raised at least six inches to avoid injuring snakes and to leave some grassy cover.

   d. Traffic - Control vehicle access to avoid vehicular mortality of giant garter snakes.

4. Use a water maintenance regime that will maintain some open water to provide vegetated edge for giant garter snake to forage along.

5. Eradicate/control non-natives and invasive exotics.

<u>Compatible uses of giant garter snake replacement habitat</u>
Rice farming is a compatible land use for adjacent properties.

Appendix A

Uses of giant garter snake replacement habitat that are incompatible with the habitat of giant garter snake, or represent threats to giant garter snakes include row cropping uplands, orchards on uplands, OHV use, and combining with riparian habitat creation which requires dense cover or SRA habitat.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
3310 El Camino Avenue, Suite 130
Sacramento, California 95821-6340

IN REPLY REFER TO:
1-1-99-TA-1534

June 28, 1999

Memorandum

To: Distribution

From: Field Supervisor, Sacramento Fish and Wildlife Office, Sacramento, California

Subject: Dissemination of Standard Recommendations for the Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance

The U.S. Fish and Wildlife Service (Service) provides the attached standard recommendations for the protection of the San Joaquin kit fox (*Vulpes macrotis mutica)* prior to or during ground disturbing activities. The attached standard recommendations are subject to revision by the Service at any time. Successful implementation of the standard recommendations will require ongoing contact with the Service before and during the ground disturbance. Questions regarding this guidance may be addressed to Sheila Larsen, Susan Jones, or Jesse Wild of the Sacramento Fish and Wildlife Office at (916) 979-2710. Please note that after July 23, 1999 the Service will be moving to a new address, 2800 Cottage Way, West 2605, Sacramento, California 95826. No new telephone number is available at this time.

Karen J. Miller
for Wayne S. White

Attachment

U.S. FISH AND WILDLIFE SERVICE
STANDARDIZED RECOMMENDATIONS
FOR PROTECTION OF THE SAN JOAQUIN KIT FOX
PRIOR TO OR DURING GROUND DISTURBANCE

Prepared by the Sacramento Fish and Wildlife Office
June 1999

INTRODUCTION

The following document includes many of the San Joaquin kit fox (*Vulpes macrotis mutica*) protection measures typically recommended by the U. S. Fish and Wildlife Service (Service), prior to and during ground disturbance activities. However, incorporating relevant sections of these guidelines into the proposed project is not the only action required under the Endangered Species Act of 1973, as amended (Act). Project applicants should contact the Service in Sacramento to determine the full range of requirements that apply to your project; the address and telephone number are given at the end of this document. Formal authorization for the project may be required under either section 7 or section 10 of the Act. Implementation of the measures presented in this document may be necessary to avoid violating the provisions of the Act, including the prohibition against "take" (defined as killing, harming, or harassing a listed species, including actions that damage or destroy its habitat). Such protection measures may also be required under the terms of a biological opinion pursuant to section 7 of the Act resulting in incidental take authorization (authorization), or an incidental take permit (permit) pursuant to section 10 of the Act. The specific measures implemented to protect kit fox for any given project shall be determined by the Service based upon the applicant's consultation with the Service.

The purpose of this document is to make information on kit fox protection strategies readily available and to help standardize the methods and definitions currently employed to achieve kit fox protection. The measures outlined in this document are subject to modification or revision at the discretion of the Service.

All surveys, den destructions, and monitoring described in this document must be conducted by a qualified biologist. A qualified biologist (biologist) means any person who has completed at least four years of university training in wildlife biology or a related science and/or has demonstrated field experience in the identification and life history of the San Joaquin kit fox. In addition, biologist(s) must be able to identify coyote, red fox, gray fox, and kit fox tracks, and to have seen a kit fox in the wild, at a zoo, or as a museum mount.

SMALL PROJECTS

Small projects are considered to be those projects with small foot prints such as an individual in-fill oil well, communication tower, or bridge repair. These projects must stand alone and not be part of, or in any way connected to larger projects (i.e., bridge repair or improvement to serve a

future urban development). The Service recommends that on these small projects, the biologist survey the proposed project boundary and a 200-foot area outside of the project footprint to identify habitat features, and make recommendations on situating the project to minimize or avoid impacts. If habitat features cannot be completely avoided, then preconstruction surveys should be conducted.

Preconstruction/preactivity surveys shall be conducted no less than 14 days and no more than 30 days prior to the beginning of ground disturbance and/or construction activities or any project activity likely to impact the San Joaquin kit fox. Surveys should identify kit fox habitat features on the project site and evaluate use by kit fox and, if possible, and assess the potential impacts to the kit fox by the proposed activity. The status of all dens should be determined and mapped (see Survey Protocol).

Written results of preconstruction/preactivity surveys must be received by the Service within five days after survey completion and prior to the start of ground disturbance and/or construction activities. If a natal/pupping den is discovered within the project area or within 200-feet of the project boundary, the Service shall be immediately notified. If the preconstruction/preactivity survey reveals an active natal pupping or new information, the project applicant should contact the Service immediately to obtain the necessary take authorization/permit.

If take authorization/permit has already been issued, then the biologist may proceed with den destruction within the project boundary, except natal/pupping dens (active or inactive). Protective exclusion zones can be placed around all known and potential dens which occur outside the project footprint (conversely, the project boundary can be demarcated, see den destruction section).

OTHER PROJECTS

It is likely that all other projects occurring within kit fox habitat will require a take authorization/permit from the Service. This determination would be made by the Service during the early evaluation process (see Survey Protocol). These other projects would include, but are not limited to: linear projects; projects with large footprints such as urban development; and projects which in themselves may be small but have far reaching impacts (i.e., water storage or conveyance facilities that promote urban growth or agriculture, etc.).

The take authorization/permit issued by the Service may incorporate some or all of the protection measures presented in this document. The take authorization/permit may include measures specific to the needs of the project, and those requirements supersede any requirements found in this document.

EXCLUSION ZONES

The configuration of exclusion zones around the kit fox dens should have a radius measured outward from the entrance or cluster of entrances. The following radii are minimums, and if they cannot be followed the Service must be contacted:

Potential den	50 feet
Known den	100 feet
Natal/pupping den (occupied and unoccupied)	Service must be contacted
Atypical den	50 feet

Known den: To ensure protection, the exclusion zone should be demarcated by fencing that encircles each den at the appropriate distance and does not prevent access to the den by kit foxes. Exclusion zone fencing should be maintained until all construction related or operational disturbances have been terminated. At that time, all fencing shall be removed to avoid attracting subsequent attention to the dens.

Potential and Atypical dens: Placement of 4-5 flagged stakes 50 feet from the den entrance(s) will suffice to identify the den location; fencing will not be required, but the exclusion zone must be observed.

Construction and other project activities should be prohibited or greatly restricted within these exclusion zones. Only essential vehicle operation on existing roads and foot traffic should be permitted. Otherwise, all construction, vehicle operation, material storage, or any other type of surface-disturbing activity should be prohibited within the exclusion zones.

DESTRUCTION OF DENS

Disturbance to all San Joaquin kit fox dens should be avoided to the maximum extent possible. Protection provided by kit fox dens for use as shelter, escape, cover, and reproduction is vital to the survival of the species. Limited destruction of kit fox dens may be allowed, if avoidance is not a reasonable alternative, provided the following procedures are observed. The value to kit foxes of potential, known, and natal/pupping dens differ and therefore, each den type needs a different level of protection. **Destruction of any known or natal/pupping kit fox den requires take authorization/permit from the Service.**

Natal/pupping dens: Natal or pupping dens which are occupied will not be destroyed until the pups and adults have vacated and then only after consultation with the Service. Therefore, project activities at some den sites may have to be postponed.

Known Dens: Known dens occurring within the footprint of the activity must be monitored for three days with tracking medium or an infra-red beam camera to determine the current use. If no kit fox activity is observed during this period, the den should be destroyed immediately to preclude subsequent use. If kit fox activity is observed at the den during this period, the den should be monitored for at least five consecutive days from the time of the observation to allow any resident animal to move to another den during its normal activity. Use of the den can be discouraged during this period by partially plugging its entrances(s) with soil in such a manner that any resident animal can escape easily. Only when the den is determined to be unoccupied may the den be excavated under the direction of the biologist. If the animal is still present after five or more consecutive days of plugging and monitoring, the den may have to be excavated when, in the judgment of a biologist, it is temporarily vacant, for example during the animal's normal foraging activities. The Service encourages hand excavation, but realizes that soil conditions may necessitate the use of excavating equipment. However, extreme caution must be exercised.

Destruction of the den should be accomplished by careful excavation until it is certain that no kit foxes are inside. The den should be fully excavated, filled with dirt and compacted to ensure that kit foxes cannot reenter or use the den during the construction period. If at any point during excavation a kit fox is discovered inside the den, the excavation activity shall cease immediately and monitoring of the den as described above should be resumed. Destruction of the den may be completed when in the judgement of the biologist, the animal has escaped from the partially destroyed den.

Potential Dens: If a take authorization/permit has been obtained from the Service, den destruction may proceed without monitoring, unless other restrictions were issued with the take authorization/permit. If no take authorization/permit has been issued, then potential dens should be monitored as if they were known dens. If any den was considered to be a potential den, but is later determined during monitoring or destruction to be currently, or previously used by kit fox (e.g., if kit fox sign is found inside), then destruction shall cease and the Service shall be notified immediately.

CONSTRUCTION AND OPERATIONAL REQUIREMENTS

Habitat subject to permanent and temporary construction disturbances and other types of project-related disturbance should be minimized. Project designs should limit or cluster permanent project features to the smallest area possible while still permitting project goals to be achieved. To minimize temporary disturbances, all project-related vehicle traffic should be restricted to established roads, construction areas, and other designated areas. These areas should also be

included in preconstruction surveys and, to the extent possible, should be established in locations disturbed by previous activities to prevent further impacts.

1. Project-related vehicles should observe a 20-mph speed limit in all project areas, except on county roads and State and Federal highways; this is particularly important at night when kit foxes are most active. To the extent possible, night-time construction should be minimized. Off-road traffic outside of designated project areas should be prohibited.

2. To prevent inadvertent entrapment of kit foxes or other animals during the construction phase of a project, all excavated, steep-walled holes or trenches more than 2 feet deep should be covered at the close of each working day by plywood or similar materials, or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they should be thoroughly inspected for trapped animals. If at any time a trapped or injured kit fox is discovered, the procedures under number 13 of this section must be followed.

3. Kit foxes are attracted to den-like structures such as pipes and may enter stored pipe becoming trapped or injured. All construction pipes, culverts, or similar structures with a diameter of 4-inches or greater that are stored at a construction site for one or more overnight periods should be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a kit fox is discovered inside a pipe, that section of pipe should not be moved until the Service has been consulted. If necessary, and under the direct supervision of the biologist, the pipe may be moved once to remove it from the path of construction activity, until the fox has escaped.

4. All food-related trash items such as wrappers, cans, bottles, and food scraps should be disposed of in closed containers and removed at least once a week from a construction or project site

5. No firearms shall be allowed on the project site.

6. To prevent harassment, mortality of kit foxes or destruction of dens by dogs or cats, no pets should be permitted on project sites.

7. Use of rodenticides and herbicides in project areas should be restricted. This is necessary to prevent primary or secondary poisoning of kit foxes and the depletion of prey populations on which they depend. All uses of such compounds should observe label and other restrictions mandated by the U.S. Environmental Protection Agency, California Department of Food and Agriculture, and other State and Federal legislation, as well as additional project-related restrictions deemed necessary by the Service. If rodent control

must be conducted, zinc phosphide should be used because of proven lower risk to kit fox.

8. A representative shall be appointed by the project proponent who will be the contact source for any employee or contractor who might inadvertently kill or injure a kit fox or who finds a dead, injured or entrapped individual. The representative will be identified during the employee education program. The representative's name and telephone number shall be provided to the Service.

9. An employee education program should be conducted for any project that has expected impacts to kit fox or other endangered species. The program should consist of a brief presentation by persons knowledgeable in kit fox biology and legislative protection to explain endangered species concerns to contractors, their employees, and military and agency personnel involved in the project. The program should include the following: a description of the San Joaquin kit fox and its habitat needs; a report of the occurrence of kit fox in the project area; an explanation of the status of the species and its protection under the Endangered Species Act; and a list of measures being taken to reduce impacts to the species during project construction and implementation. A fact sheet conveying this information should be prepared for distribution to the above-mentioned people and anyone else who may enter the project site.

10. Upon completion of the project, all areas subject to temporary ground disturbances, including storage and staging areas, temporary roads, pipeline corridors, etc. should be re-contoured if necessary, and revegetated to promote restoration of the area to pre-project conditions. An area subject to "temporary" disturbance means any area that is disturbed during the project, but that after project completion will not be subject to further disturbance and has the potential to be revegetated. Appropriate methods and plant species used to revegetate such areas should be determined on a site-specific basis in consultation with the Service, California Department of Fish and Game (CDFG), and revegetation experts.

11. In the case of trapped animals, escape ramps or structures should be installed immediately to allow the animal(s) to escape, or the Service should be contacted for advice.

12. Any contractor, employee, or military or agency personnel who inadvertently kills or injures a San Joaquin kit fox shall immediately report the incident to their representative. This representative shall contact the CDFG immediately in the case of a dead, injured or entrapped kit fox. The CDFG contact for immediate assistance is State Dispatch at (916) 445-0045. They will contact the local warden or biologist.

13. The Sacramento Fish and Wildlife Office and CDFG will be notified in writing within three working days of the accidental death or injury to a San Joaquin kit fox during

project related activities. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information. The Service contact is the Chief of the Division of Endangered Species, at the addresses and telephone numbers given below. The CDFG contact is Mr. Ron Schlorff at 1416 9th Street, Sacramento, California 95814, (916) 654-4262.

Any project-related information required by the Service or questions concerning the above conditions or their implementation may be directed in writing to the U.S. Fish and Wildlife Service, until July 23, 1999 at:

Endangered Species Division
3310 El Camino Avenue, Suite 130
Sacramento, California 95821-6340
(916) 979-2710

After July 23, 1999 please direct mail to:
Endangered Species Division
2800 Cottage Way, West 2605
Sacramento, California 95826
(no telephone number available yet,
please call the old number for a forwarding number)

"Take" - Section 9 of the Endangered Species Act of 1973, as amended (Act) prohibits the "take" of any federally listed endangered species by any person (an individual, corporation, partnership, trust, association, etc.) subject to the jurisdiction of the United States. As defined in the Act, take means " . . . to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." Thus, not only is a listed animal protected from activities such as hunting, but also from actions that damage or destroy its habitat.

"Dens" - San Joaquin kit fox dens may be located in areas of low, moderate, or steep topography. Den characteristics are listed below, however, the specific characteristics of individual dens may vary and occupied dens may lack some or all of these features. Therefore, caution must be exercised in determining the status of any den. Typical dens may include the following: (1) one or more entrances that are approximately 5 to 8 inches in diameter; (2) dirt berms adjacent to the entrances; (3) kit fox tracks, scat, or prey remains in the vicinity of the den; (4) matted vegetation adjacent to the den entrances; and (5) manmade features such as culverts, pipes, and canal banks.

"Known den" - Any existing natural den or manmade structure that is used or has been used at any time in the past by a San Joaquin kit fox. Evidence of use may include historical records, past or current radiotelemetry or spotlighting data, kit fox sign such as tracks, scat, and/or prey remains, or other reasonable proof that a given den is being or has been used by a kit fox. The Service discourages use of the terms "active" and "inactive" when referring to any kit fox den because a great percentage of occupied dens show no evidence of use, and because kit foxes change dens often, with the result that the status of a given den may change frequently and abruptly.

"Potential Den" - Any subterranean hole within the species' range that has entrances of appropriate dimensions for which available evidence is insufficient to conclude that it is being used or has been used by a kit fox. Potential dens shall include the following: (1) any suitable subterranean hole; or (2) any den or burrow of another species (e.g., coyote, badger, red fox, or ground squirrel) that otherwise has appropriate characteristics for kit fox use.

"Natal or Pupping Den" - Any den used by kit foxes to whelp and/or rear their pups. Natal/pupping dens may be larger with more numerous entrances than dens occupied exclusively by adults. These dens typically have more kit fox tracks, scat, and prey remains in the vicinity of the den, and may have a broader apron of matted dirt and/or vegetation at one or more entrances. A natal den, defined as a den in which kit fox pups are actually whelped but not necessarily reared, is a more restrictive version of the pupping den. In practice, however, it is difficult to distinguish between the two, therefore, for purposes of this definition either term applies.

"Atypical Den" - Any manmade structure which has been or is being occupied by a San Joaquin kit fox. Atypical dens may include pipes, culverts, and diggings beneath concrete slabs and buildings.

Informal ESA Consultation, NOAA Fisheries

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

May 23, 2001

In Response Refer To:
SWR-01-SA-5984:MEA

Russell W. Grimes (MP-700)
U.S. Bureau of Reclamation
Mid-Pacific Regional Office
2800 Cottage Way
Sacramento, California 95825-1898

Dear Mr. Grimes:

This is in response to your letter of March 9, 2001 requesting concurrence by the National Marine Fisheries Service (NMFS) with a determination by the Bureau of Reclamation (Bureau) that the Mendota Wildlife Area Water Conveyance Facilities Project is not likely to adversely effect federally endangered Sacramento River winter-run chinook salmon (*Oncorhynchus tshawytscha*), threatened Central Valley spring-run chinook salmon (*O. tshawytscha*), and threatened Central Valley steelhead (*O. mykiss*), or adversely modify designated critical habitat. An Environmental Assessment/Initial Study and Proposed Finding of No Significant Impact/Negative Declaration, dated June 1999, was enclosed with your letter.

The preferred alternative under consideration is to replace the existing Dam with a new structure. The new Dam will be located approximately 400 feet downstream of the existing structure and will consist of earthen embankments, with a 115-foot wide, eight-bay, gated concrete structure near the center of the San Joaquin River channel. Normal flows will be passed by a double sluice gate assembly (two 54-inch by 54-inch sluice gates) with energy dissipators and a total of 560 cfs maximum regulated capacity. The new dam will be designed so that it can be retrofitted with a fish passageway in the future to allow for anadromous fish passage up- and downstream. The new Dam will increase the capacity of Mendota Pool (currently 3,000 acre-feet) by approximately 13 acre-feet.

Available records indicate that federally listed Sacramento River winter-run chinook salmon and Central Valley spring-run chinook salmon do not occur within the project area. Although Central Valley steelhead do occur within the middle San Joaquin basin there are no recent records of steelhead spawning or rearing in the mainstem San Joaquin, including the project area. Central Valley steelhead have been recorded in the San Joaquin River tributaries downstream of the project area and use the middle-lower San Joaquin River during migration. Critical habitat for

Central Valley steelhead has been designated and includes the lower San Joaquin River upstream to, and including, the Merced River basin. Designated critical habitat for Central Valley steelhead does not occur within the project area.

Based on a review of the material provided with your letter of March 9, 2001, and the best available information we concur with the Bureau's determination that the Mendota Wildlife Area Water Conveyance Facilities Project is not likely to adversely affect endangered Sacramento River winter-run chinook salmon, threatened Central Valley steelhead or Central Valley spring-run chinook salmon, nor is it anticipated that the proposed project will adversely modify designated critical habitat. This concludes section 7 consultation for the proposed project. However, if new information indicates that the proposed action may affect listed species or designated critical habitat in a manner or to an extent not considered in this review, or new species and/or critical habitat are designated that may be affected by the proposed action, this determination may be reconsidered and further consultation may be necessary.

The Bureau should be aware that the proposed project area has been identified as Essential Fish Habitat (EFH) for chinook salmon (*Oncorhynchus tshawytscha*) in Amendment 14 of the Pacific Salmon Fishery Management Plan pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (MSA). Federal action agencies are mandated by MSA (section 305[b][2]) to consult with NMFS on all actions that may adversely affect EFH and NMFS must provide EFH Conservation Recommendations (section 305[b][4][A]). We have determined that EFH for chinook salmon may be affected by the proposed action. Therefore, an EFH consultation is required. Although your letter of March 9, 2001 did not initiate EFH consultation we are doing so at this time. We will make every effort to complete EFH consultation in an abbreviated period (within 30 days of this letter). The MSA requires that the Bureau respond to our EFH Conservation Recommendations in writing within 30 days of receipt. The regulations also require that such a response be provided at least 10 days prior to final approval of the action.

If you have any questions regarding this response, please contact Mr. Michael Aceituno, Supervisor, Sacramento Area Office, 650 Capitol Mall, Suite 8-300, Sacramento, CA 95814. Mr. Aceituno may be reached by telephone at (916) 930-3600 or by FAX at (916) 930-3629.

Sincerely,

for Rebecca Lent, Ph.D.
Regional Administrator

Essential Fish Habitat Consultation, NOAA Fisheries

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Sacramento Area Office
650 Capitol Mall, Suite 8-300
Sacramento, California 95814-4706

August 16, 2001

In Response Refer To:
SWR-01-SA-5984(EFH):MEA

Russell W. Grimes (MP-700)
U.S. Bureau of Reclamation
Mid-Pacific Regional Office
2800 Cottage Way
Sacramento, California 95825-1898

Dear Mr. Grimes:

This letter transmits the National Marine Fisheries Service (NMFS) Essential Fish Habitat (EFH) Conservation Recommendations for Central Valley chinook salmon (*Oncorhynchus tshawytscha*), as required by the Magnuson-Stevens Fishery Conservation and Management Act (MSA), for the Mendota Wildlife Area Water Conveyance Facilities Project.

The EFH Conservation Recommendations are based on written descriptions of the project provided in the June 1999 Environmental Assessment/Initial Study and Proposed Finding of No Significant Impact/Negative Declaration for the proposed project

Reclamation has a statutory requirement under section 305(b)(4)(B) of the MSA and federal regulation 50 CFR 600.920(j) to submit a detailed response in writing to NMFS that includes a description of measures proposed to avoid, minimize, mitigate, or offset the adverse impact of the activity on EFH. If your response is inconsistent with any of the EFH Conservation Recommendation by NMFS, you must explain your reasons for not implementing the recommendation(s).

If you have any questions concerning the enclosed EFH Conservation Recommendations, please contact me at (916) 930-3600.

Sincerely,

Michael R. Aceituno
Supervisor, Sacramento Area Office

Enclosure

cc: NMFS, ARA-PRD(F/SWR3), Long Beach, CA
Mark Helvey, NMFS (F/SWR4), Long Beach, CA

Magnuson-Stevens Fishery Conservation and Management Act

ESSENTIAL FISH HABITAT CONSERVATION RECOMMENDATIONS

Agencies: U.S. Bureau of Reclamation

Activity: Mendota Wildlife Area Water Conveyance Facilities Project

Consultation Conducted By: National Marine Fisheries Service, Southwest Region.

Date Issued: August 16, 2001

I. Background

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-297), requires the inclusion of Essential Fish Habitat (EFH) descriptions in Federal fishery management plans. In addition, the MSA requires Federal agencies to consult with the National Marine Fisheries Service (NMFS) on activities that may adversely effect EFH. The objective of EFH consultation is to determine whether the proposed action may adversely effect designated EFH for relevant species, and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH resulting from the proposed action.

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting the definition of EFH: "waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.110).

The consultation requirements of section 305(b) of the MSA (16 U.S.C. 1855(b)) provide that:

- Federal agencies must consult with the NMFS on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely effect EFH;
- The NMFS shall provide conservation recommendations for any Federal or State activity that may adversely affect EFH;
- Federal agencies shall within 30 days after receiving conservation recommendations from the NMFS provide a detailed response in writing to the NMFS regarding the conservation recommendations. The response shall include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case

of a response that is inconsistent with the conservation recommendations of the NMFS, the Federal agency shall explain its reasons for not following the recommendations.

The MSA requires consultation for all actions that may adversely affect EFH, and does not distinguish between actions within EFH and actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside EFH, such as upstream and upslope activities, that may have an adverse effect on EFH. Therefore, EFH consultation with the NMFS is required by Federal agencies undertaking, permitting, or funding activities that may adversely affect EFH, regardless of its location.

II. Identification of Essential Fish Habitat (EFH)

The Pacific Fisheries Management Council (PFMC) has designated EFH for chinook salmon (*Oncorhynchus tshawytscha*) in Washington, Oregon, Idaho, and California (PFMC 1999). Freshwater EFH for chinook salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon, except areas upstream of certain impassable man-made barriers (as identified by the PFMC), and longstanding, naturally-impassable barriers (i.e., natural waterfalls in existence for several hundred years) (PFMC 1999). In estuarine and marine areas, designated salmon EFH extends from the nearshore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone (370.4 km) offshore of Washington, Oregon, and California north of Point Conception to the Canadian border.

The geographic extent of EFH for salmon in the San Joaquin River Basin is specifically defined as all currently viable waters and most of the habitat historically accessible to salmon within the following hydrologic units: 18040001 (Middle San Joaquin - Lower Chowchilla), 18040002 (Middle San Joaquin - Lower Merced - Lower Stanislaus), 18040003 (San Joaquin Delta), 18040004 (Lower Calaveras - Mormon Slough), 18040005 (Lower Cosumnes - Lower Mokelumne), 18040010 (Upper Stanislaus), 18040011 (Upper Calaveras), and 18040013 (Upper Cosumnes) . Within these hydrologic units salmon EFH includes aquatic areas above all artificial barriers except areas upstream of longstanding naturally impassible barriers (i.e. natural waterfalls in existence for several hundred years) or the following specified dams: Friant Dam, San Joaquin River; Crocker Diversion Dam, Merced River; La Grange Dam, Tuolumne River; Goodwin Dam, Stanislaus River; Camanche Dam, Mokelumne River; and, New Hogan Dam, Calaveras River. Activities occurring above impassable barriers, however, that are likely to adversely affect EFH below these barriers are subject to the consultation provisions of the MSA. Appendix A to Amendment 14 to the Pacific Coast Salmon Plan provides detailed descriptions and identifications of EFH for chinook salmon (PFMC 1999).

Historical Distribution

Historically, the San Joaquin River, and its principal tributaries, the Merced, Tuolumne, and Stanislaus Rivers once supported spring and fall runs of chinook salmon (Reynolds et al. 1993).

Spring-run chinook salmon were once the most abundant salmon run in the San Joaquin drainage, exceeding 100,000 fish annually (Moore et al., 1990), however, they have been extirpated since1942 because of dam construction that blocked access to cold-water habitat upstream (Yoshiyama et al., 1996). Fall run chinook salmon are currently the only salmon occurring within the San Joaquin. Recent estimates find that fall-run chinook have declined between 85 percent to 90 percent (Rich and Loudermilk, 1991; USFWS, 1995) of the population levels which existed in the 1940's. Fall-run chinook spawning population estimates from the Stanislaus, Tuolumne and Merced Rivers from 1974 to 1991 show both rising and descending trends lasting for several years(Kano, 1996; 1998). Factors limiting salmon populations within the San Joaquin system include: 1) mainstem barriers to historic spawning and rearing areas; 2) insufficient instream flows for passage; 3) lack of spawning and rearing habitat; 4) losses associated with unscreened diversions and predation; and, 5) losses associated with export pumping in the southern Sacramento-San Joaquin Delta.

Life History and Habitat Requirements

General life history information for Central Valley chinook salmon is summarized below. Further detailed information on chinook salmon ESUs are available in the NMFS status review of chinook salmon from Washington, Idaho, Oregon, and California (Myers et al., 1998).

Central Valley fall-run chinook enter the Sacramento and San Joaquin Rivers from July through April and spawn from October through December (USFWS, 1998) with spawning occurring from October through December although San Joaquin River populations tend to spawn later in the year than Sacramento River populations (Myers et al. 1998). Peak spawning occurs in October and November (Reynolds et al., 1993). Chinook salmon spawning generally occurs in swift, relatively shallow riffles or along the edges of fast runs at depths greater than 6 inches, usually 1-3 feet to 10-15 feet. Preferred spawning substrate is clean loose gravel and gravels are unsuitable when they have been cemented with clay or fines or when sediments settle out onto redds reducing intergravel percolation (NMFS, 1997).

Egg incubation occurs from October through March, and juvenile rearing and smolt emigration occurs from January through June (Reynolds et. al., 1993). At the time of emergence from their gravel nests, most fry disperse downstream towards the estuary shortly after they emerge or as smolts (Kjelson et al., 1982), hiding in the gravel or stationing in calm, shallow waters with fine sediments substrate and bank cover such as tree roots, logs, and submerged or overhead vegetation. Juvenile rearing occurs from January through mid May and the smaller fry inhabit marginal areas of the river, particularly back eddies, behind fallen trees, undercut tree roots or over areas of bank cover (Lister and Genoe, 1970). Juvenile emigration occurs from mid March through mid June. Chinook fry prefer slower velocity streambank areas and orient upstream to the current as opposed to the smolt stage that swims downstream with the current (Schaffter, 1980). As they grow, the juveniles associate with coarser substrates along the stream margin or farther from shore (Healey, 1991). Along the emigration route, submerged and overhead cover in the form of rocks, submerged aquatic vegetation, logs, riparian vegetation, and undercut banks

provide food, shade and protect juveniles from predation.

Principal foods of chinook while rearing in freshwater and estuarine environments are larval and adult insects and zooplankton such as *Daphnia*, flys, gnats, mosquitoes or copepods (Kjelson et al. 1982), stonefly nymphs or beetle larvae (Chapman and Quistdorff 1938) as well as other estuarine and freshwater invertebrates.

III. PROPOSED ACTION.

The Bureau of Reclamation (Reclamation), in cooperation with the U.S. Fish and Wildlife Service (Service) and the California Department of Fish and Game (Department), proposes to replace the existing Mendota Dam on the San Joaquin River, in Fresno County, California. The purpose of the proposed project is to provide for year-round delivery of water supplies to the Mendota Wildlife Area and eliminate the frequent dewatering of Mendota Pool currently required for inspection and maintenance of the existing facilities.

The proposed new dam will be located approximately 400 feet downstream from the existing structure and will consist of earthen embankments, with a 115 foot wide, eight bay, gated concrete structure near the center of the San Joaquin River channel. The preliminary design flood event for the eight 15 ft. X 18 ft. radial control gates was 10,000 cubic feet per second (cfs). Normal flows would be passed by two 54 inch X 54 inch sluice gates with energy dissipators with a maximum regulated capacity of 560 cfs.

The new dam will be designed so that it can be retrofitted with a fish passageway in the future to allow for upstream and downstream movement of anadromous fish.

Capacity of Mendota Pool behind Mendota Dam will be increased from the current level of 3,000 acre-feet to approximately 3,013 acre-feet. The maximum surface elevation of the pool is not expected to increase over current levels.

IV. EFFECTS OF THE PROPOSED ACTION

In recent years, chinook salmon have not been able to access the mainstem San Joaquin River, above the confluence of the Merced River, due to installation of a seasonal barrier by the California Department of Fish and Game (CDFG). In addition, insufficient instream flows in most years between Friant Dam and the Merced River have limited mainstem populations.

Minimum instream flows, downstream of the new Mendota Dam, are expected to be unchanged from current conditions. In addition, the capacity of Mendota Pool will be minimally increased (+13 acre-feet) with no expected increase in maximum surface elevation of the pool over current conditions. The capacity for year-round delivery of water may provide for instream habitat

improvement opportunities through improved flow regimes downstream of Mendota Dam. However, this capability is expected to be minimal due to limited storage capacity of Mendota Pool. In addition, continued installation of the seasonal barrier on the mainstem San Joaquin River by CDFG will limit potential benefits to existing chinook salmon populations and preclude their use of available EFH.

Although the new Mendota Dam will be designed so that it can be retrofitted with a fish passageway in the future, no means have been addressed to allow for fish passage during the interim.

V. CONCLUSION

Upon review of the current baseline conditions and the expected effects of the proposed Mendota Wildlife Area Water Conveyance Facilities Project, NMFS believes the proposed action will not adversely effect EFH currently accessible to chinook salmon. However, construction of the new Mendota Dam without a fish passageway, combined with the continued installation of the seasonal barrier at the Merced River by CDFG, is likely to limit San Joaquin River salmon enhancement or recovery efforts by blocking passage of chinook salmon upstream of the project area, therefore, adversely affecting salmon EFH.

VI. EFH CONSERVATION RECOMMENDATIONS

Pursuant to section 305(b)(4)(A) of the Magnuson-Stevens Act, NMFS is required to provide EFH conservation recommendations for any Federal or state agency action that would adversely affect EFH. The EFH Conservation Measures proposed are as follows:

1. Reclamation shall use every means available to complete the San Joaquin River Basin Comprehensive Plan (Section 3406(c)(1) of the CVPIA) as soon as practicable.

2. Reclamation shall work with the U.S. Fish and Wildlife Service to develop and implement aspects of the Anadromous Fish Restoration Program (Section 3406(b)(1) of the CVPIA) addressing the mainstem San Joaquin River from Mendota Pool to the Sacramento-San Joaquin Delta, including the development and implementation of a program that makes all reasonable efforts to ensure natural production of chinook salmon in the San Joaquin River below Mendota Dam which will be sustainable, on a long-term basis.

3. The new Mendota Dam shall be designed with a fish passageway to allow upstream and downstream movement of chinook salmon with minimal predation potential. NMFS engineering staff shall be consulted in developing the fish passageway design. Recognizing that the passageway may not be needed immediately the new dam may be retrofitted with the fish passageway as required and funding is available. Prior to construction of the fish

passageway the final design shall be reviewed and approved by NMFS.

VI. STATUTORY RESPONSE REQUIREMENTS

The Magnuson-Stevens Act (Section 305(b)) and Federal regulations (50 CFR 600.920(j)) require federal action agencies to provide a written response to NMFS after receiving EFH Conservation Recommendations within 30 days of receipt. This response must include a description of measures proposed to avoid, minimize, mitigate, or offset the adverse impacts of the activity on EFH. If your response is inconsistent with a EFH Conservation Recommendation by NMFS, the agency must explain its reasons for not implementing the recommendation.

VII. LITERATURE CITED

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USFWS Draft Coordination Act Report

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

IN REPLY REFER TO:

December 10, 2002

Memorandum

To: Chief, Division of Planning and Technical Services,
U.S. Bureau of Reclamation, Sacramento, California

From: Acting Field Supervisor, Ecological Services,
U.S. Fish and Wildlife Service, Sacramento, California

Subject: USBR-Final Conveyance of Refuge Water Supply for Mendota Wildlife Area EA/Negative Declaration

Enclosed is the U.S. Fish and Wildlife Service's (Service) draft Fish and Wildlife Coordination Act (FWCA) report for the Conveyance of Refuge Water Supply for Mendota Wildlife Area Project, in Fresno County, California. This report has been prepared under the authority of, and in accordance with, the provisions of section 2(b) of the FWCA (48 stat. 401, as amended; 16 U.S.C. 661 *et seq.*). It addresses the impacts of constructing a new dam at Mendota Pool on the San Joaquin River, provides information regarding endangered, threatened, proposed, and candidate species potentially found in the project area, and contains our recommendations. This analysis is based on information provided by the Bureau of Reclamation (Reclamation) in their September 2000 Environmental Assessment (EA), a literature review, personal communication with recognized experts, field investigations, and professional judgement.

This report is also being coordinated with the California Department of Fish and Game and the National Marine Fisheries Service. Full consideration will be given to their comments and recommendations and any revisions to this report based on their input, or based on other information that may come to our attention, will be provided to you by subsequent memoranda.

We have applied the Habitat Evaluation Procedures (HEP) methodology (Attachment A) to quantify the value of habitats for aquatic and terrestrial resources in the project area. Our resource protection goals are based on the Service's Mitigation Policy (Federal Register 46:15, January 23, 1981). The HEP and the Mitigation Policy do not apply to assessments of impacts or mitigation planning for threatened and endangered species.

A list of endangered and threatened species that may be present in the project area is included for your information (Attachment B). Attachment B also provides a summary of a Federal Agency's responsibilities under section 7(a) and (c) of the Endangered Species Act of 1973, as amended

A list of endangered and threatened species that may be present in the project area is included for your information (Attachment B). Attachment B also provides a summary of a Federal Agency's responsibilities under section 7(a) and (c) of the Endangered Species Act of 1973, as amended (Act). We recommend Reclamation review its requirements, published in 50 CFR 402, for compliance with the Act. The Service has consultation responsibility for most of the federally listed species that may be affected by the project, and this office should be contacted regarding further consultation requirements. The California Department of Fish and Game should be contacted regarding State listed species.

Thank you for the opportunity to contribute to your planning process. If you have any questions regarding this report, please contact Mark Littlefield of my staff at (916) 414-6600.

Attachments

cc (w/attachment):
AES, Portland, OR
NMFS, Santa Rosa, CA
CDFG, Director, Sacramento, CA
CDFG, Reg. Mgr., Region IV, Fresno, CA
COE, Chief of Planning Division, Sacramento, CA
SJRMP, DWR, Sacramento, CA
CCID, Los Banos, CA

UNITED STATES DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

FISH AND WILDLIFE COORDINATION ACT REPORT

CONVEYANCE OF REFUGE WATER SUPPLY FOR MENDOTA WILDLIFE AREA

PREPARED FOR:

U.S. Bureau of Reclamation
Mid-Pacific Region
Sacramento, California

December 2002

Table of Contents

LIST OF ATTACHMENTS

LIST OF FIGURES

LIST OF TABLES

INTRODUCTION

The Bureau of Reclamation (Reclamation) and the California Department of Fish and Game (CDFG) have identified and evaluated alternatives for conveying reliable water supplies to Mendota Wildlife Area (MWA) in Fresno County, California. This project was implemented pursuant to section 3406(d)(5) of the Central Valley Project Improvement Act (CVPIA).

The proposed project would address the need to maintain water levels in Mendota Pool in the fall and winter months so that the CDFG can make full use of their existing firm water supply at MWA. Currently, Central California Irrigation District (CCID), operator of the Mendota Dam, annually ceases maintenance of the water level in the Pool about November 15 to provide for flood control. In addition, Mendota Pool is completely dewatered periodically to allow for dam safety inspections. These two agencies previously awarded a contract for a reconnaissance study of relocating the dam in 1988 (CCID 1988). The Fish and Wildlife Service (Service) completed a preliminary analysis of impacts for Reclamation in 1993 using the information developed in the reconnaissance study. This report is intended to update and supplement the previously completed work by quantifying impacts to fish and wildlife resources.

The existing Mendota Dam is located on the Fresno - Madera County line just downstream of the confluence of the San Joaquin River and Fresno Slough. The town of Mendota is located about two miles to the southwest and the State-owned MWA is located about four miles to the southwest (Figure 1).

The dam serves as the control structure for Mendota Pool, the terminal facility for the Central Valley Project's Delta-Mendota Canal. Numerous other canals use Mendota Pool as their headwaters. The existing dam is 400 feet long with an upstream water depth of approximately 16 feet. The dam is of concrete construction and has 17 large bays. Timber weir boards (6 inches by 8 inches by 19.5 feet) are set in grooves and are manually removed or added to control the height and flow of water through the dam. The structure was built in 1917 and originally included facilities for navigation. Modifications were made in 1940, which consisted of the addition of upstream and downstream aprons. Removal of the weir boards is slow and must be done prior to high runoff events.

Wetland management for a large portion of MWA and some privately owned wetlands is dependent on the water level in the pool (Figure 2). Fall flooding by gravity flow of fields on the east side of the wildlife area begins annually on October 1. Fields are flooded gradually to optimize waterfowl use and normally all fields are flooded by mid-November. These fields remain flooded until mid-March or mid-April, and then are drained when soil temperatures are conducive to germination of desirable waterfowl food plants. Normally, fields are flooded and maintained at optimum depth (~6-8 inches) for waterfowl use. When the pool water level is dropped for maintenance of Mendota Dam, fields on the wildlife area are flooded deeper than optimal where topography permits, to ensure adequate water coverage. Maintenance of the water level in these fields is then dependent on receiving local runoff from winter storms. Overfilling

FIGURE 1. PROJECT VICINITY MAP

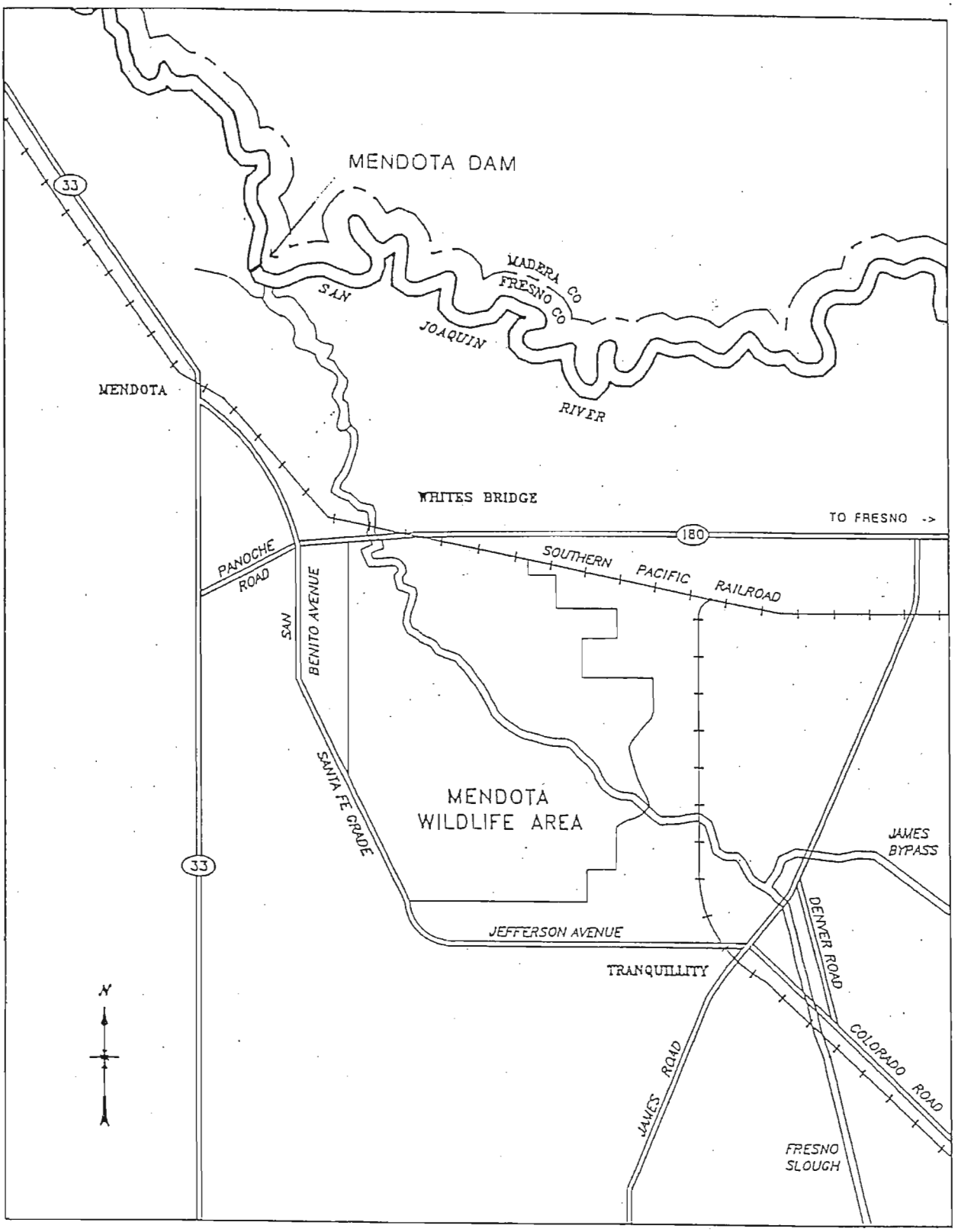
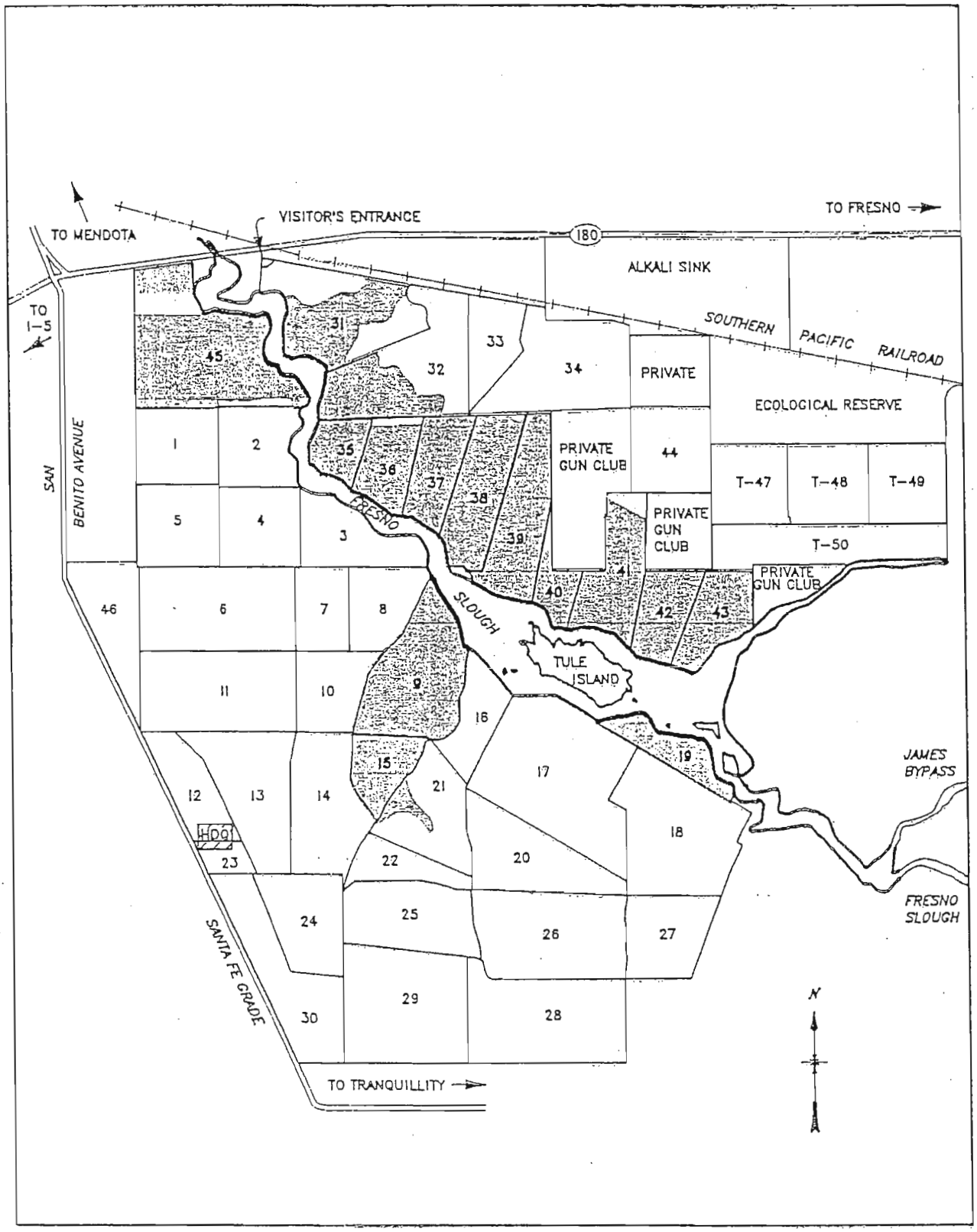


FIGURE 2. MENDOTA WILDLIFE MANAGEMENT AREA
(fields influenced by Mendota Pool water levels in yellow)



the fields initially increases the ability of the wildlife area to maintain high numbers of waterfowl, but adversely impacts their ability to feed in these areas.

PROJECT DESCRIPTION

Four alternatives, including the no action alternative, are identified in the EA/IS. Alternatives considered include a Dam Replacement Alternative, a Westside Water Piping Alternative, and a Groundwater Pumping Alternative. The Westside Water Piping Alternative would pump supplemental water from the Westlands Water District to MWA. The Groundwater Pumping Alternative would drill 30 to 40 wells on MWA. While these two alternatives were analyzed in detail in the EA/IS, the proposed action is the Dam Replacement Alternative. This report only analyzes the Dam Replacement Alternative.

The proposed action is construction of a new dam located about 400 feet downstream of the existing structure. The river decreases from 400 feet wide to about 200 feet wide at this point. The new dam would be constructed with a gated control structure with earthen embankments on either side. The existing elevations are such that the easterly embankment would extend to the existing easterly levee (Figure 3).

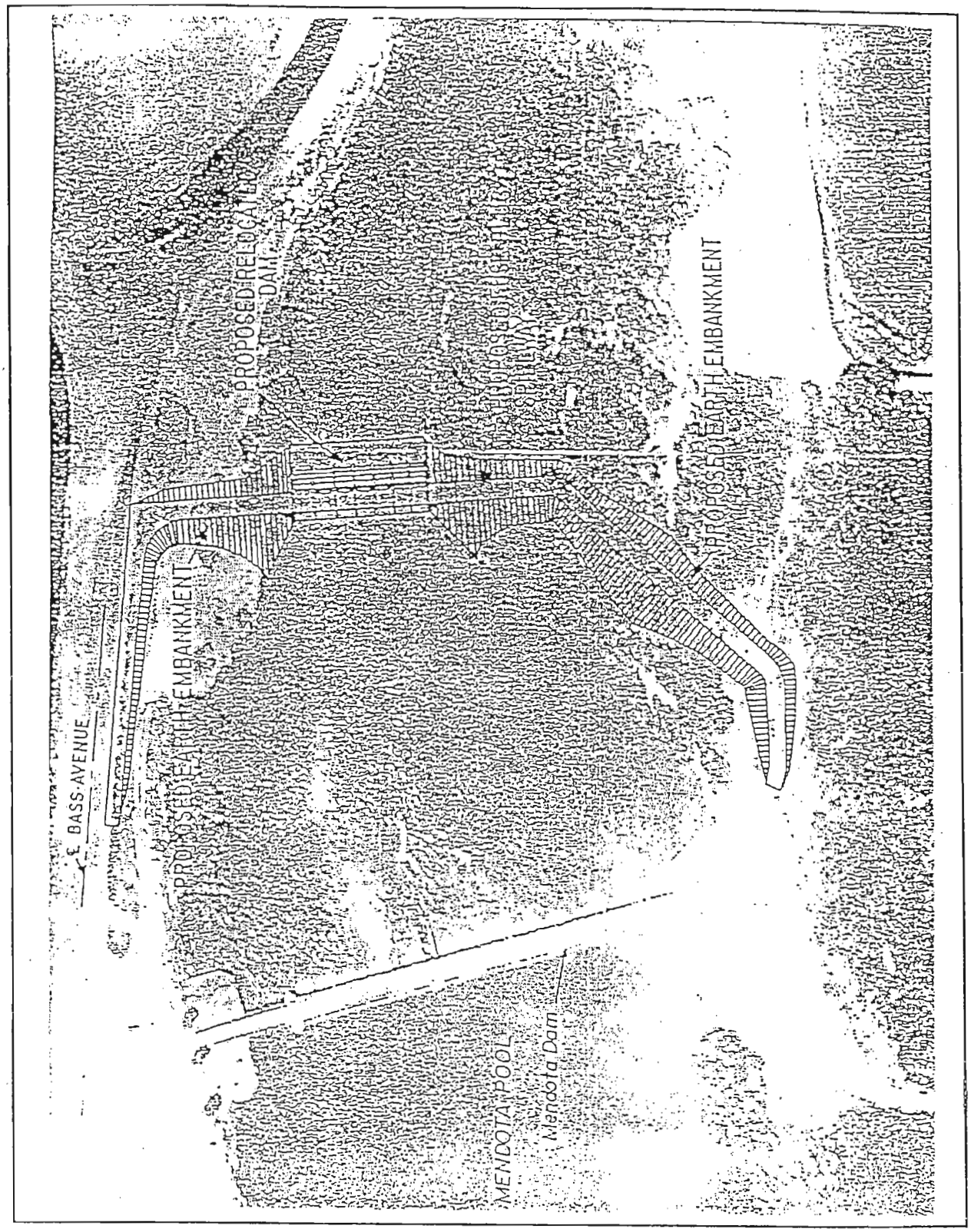
The preliminary design calls for the installation of radial control gates to handle a flood event of up to 10,000 cubic feet per second (cfs). The final design would consider all relevant data, including flood flows that occurred in January 1997. Normal flows would be passed by a double sluice gate assembly (two 54-inch by 54-inch sluice gates) with energy dissipaters and a total of 560 cfs maximum regulated capacity. The existing dam would not be removed; however, the flashboards would be removed allowing the existing dam structure to be inundated.

Operation of the new dam would be done by the CCID. The pool would need to be dewatered every 10 years for dam safety inspections and every 4 years for canal maintenance. These would be coordinated with the MWA to minimize impact to refuge operations. MWA would still have to over-flood wetland areas prior to Thanksgiving and take deliveries during alternate months when the pool is dewatered.

EXISTING RESOURCES

The following information briefly describes the fish and wildlife resources of the study area. The information presented here was largely obtained from our files on other projects in the area and field observations.

Figure 3. Proposed Mendota Dam



Vegetation

Mendota Dam Site. The predominant natural vegetation in the immediate vicinity of the dam is riparian woodland, permanent marsh, and upland (grassland). The entire area is generally surrounded by agricultural lands.

The riparian woodland is characterized by a canopy of Fremont cottonwood and willow. Understory vegetation consists of annual grasses, blackberry, and small cottonwoods and willows.

The permanent marsh is located upstream of the existing dam and is characterized by cattail and bulrush. Submergent vegetation is found along the shallow perimeter of the pool area immediately behind the dam.

The upland area is characterized by scattered areas of annual grassland. Large areas are devoid of vegetation from unrestricted vehicle access to the rivers edge.

MWA. The MWA is comprised of 12,425 acres of land managed by the CDFG as wetland and upland habitat.

A portion of the wetland habitat is managed to produce waterfowl food crops such as swamp timothy and watergrass (Huddleston 1992, personal communication). Other areas are seasonally and permanently flooded and are characterized by cattails, bulrushes, sedges, and some woody riparian vegetation such as willows.

The upland portion of the area is characterized by native scrub and grassland, woody riparian vegetation, and waterfowl food crops.

Wildlife

Mendota Dam Site. The riparian woodland and upland areas are inhabited by small mammals including cottontail rabbits, ground squirrels, voles, and various rat and mouse species. Larger mammals found in the area include striped skunk, racoon, and coyote. Aquatic mammals include beaver, muskrat, and mink. Bird species utilizing the riparian and upland areas include mourning dove, barn owl, northern harrier, red-tailed hawk, American kestrel, and numerous passerine species.

The permanent marsh and open water is utilized by water-related birds such as mallards, wood ducks, great egret, green heron, and cormorants. Aquatic mammals identified above also use the fringe areas of the permanent marsh.

The agricultural lands adjacent the dam are typically planted in cotton, alfalfa, or tomatoes and provide relatively little value for wildlife. Small rodents may be found in these areas.

MWA. Waterfowl and shorebirds use the wetlands for wintering habitat. The average annual waterfowl use of the area is estimated at 2,600,000 use-days[1] (USBR 1989). The primary waterfowl species include pintail, mallard, shoveler, cinnamon and green-winged teal, gadwall, ruddy duck, wigeon and ring-necked duck. The first five species listed also nest on the area. Snow, Ross', white-fronted, and Canada geese also use the area as well as shore and wading birds such as dowitchers, American avocets, snipe, great and snowy egrets, and great blue herons.

Mammals using the wetlands are the same as those identified for the Mendota Dam area.

The upland area supports the same small and large mammals, and raptors as described for the Mendota Dam area.

Fish

Mendota Dam Site. The San Joaquin River in the project area is dominated by warmwater fish species. Common species include green sunfish, bluegill, redear sunfish, largemouth bass, striped bass, common carp, black and brown bullhead, and mosquitofish. The San Joaquin River flow is now intermittent below Mendota Dam, consequently anadromous fish species no longer reach Mendota Dam, except for occasional flood years. There is a fish ladder in the existing dam.

protecting for future recovery efforts

Since the Delta-Mendota Canal terminus is Mendota Pool, the fish fauna of the area may include species more common in the Sacramento-San Joaquin River Delta.

MWA. Fish species on the MWA are limited to the permanent water bodies and ditches on the area. Largemouth bass, threadfin shad, carp, striped bass, brown and black bullhead, and channel catfish have been reported on the area (USBR 1989).

Threatened and Endangered Species

Mendota Dam Site and MWA. A current species list was generated for this project alternative and can be found in Attachment B along with a summary of a Federal agency's responsibilities under section 7(a) and (c) of the Endangered Species Act (Act) of 1973, as amended. According to the list there are 23 threatened and endangered species which may be found in the area. Endangered species are the California jewelflower, Greene's tuctoria, Hartweg's golden sunburst, Keck's checker-mallow, San Joaquin woolly-threads, palmate-bracted bird's-beak, Fresno kangaroo rat, San Joaquin kit fox, and blunt-nosed leopard lizard. Threatened species are the Hoover's eriastrum, Mariposa pussy-paws, San Benito evening primrose, San Joaquin Valley Orcutt grass, San Joaquin adobe sunburst, succulent owl's-clover, bald eagle, giant garter snake, California red-legged frog, delta smelt, Central Valley steelhead, Sacramento splittail, vernal

[1] A use-day is defined the occurrence of a bird on the area for all or any part of a 24-hour period.

pool fairy shrimp, and valley elderberry longhorn beetle. The mountain plover is currently listed as proposed threatened.

The CDFG has responsibility for State listed species and species of concern. A summary report from the CDFG's RareFind DataBase (April 2002) was retrieved for the project area (Attachment B). State listed endangered species are the blunt-nosed leopard lizard, Fresno kangaroo rat, palmate-bracted bird's-beak, and western yellow-billed cuckoo. Threatened species are the bank swallow, giant garter snake, San Joaquin antelope squirrel, San Joaquin kit fox, and Swainson's hawk. The CDFG should be contacted regarding any State listed species or specie of concern that may be impacted by project activities.

FUTURE CONDITIONS WITH THE PROJECT

Vegetation

Construction of a new dam at Mendota Pool would have direct impacts on fish and wildlife habitats. Table 1 lists the change in acres of the different cover-types. From our analysis, we conclude there would be a permanent loss of 2.55 acres of riparian forest and 0.20 acre of upland downstream of the existing dam. The results of the fish and wildlife resource impact analysis conducted for this project indicate that creation of 2.77 and 1.20 acres of riparian forest and upland respectively, are needed to compensate for the habitat values lost with construction of a new dam over its projected life (Attachment A).

The analysis also indicates that replacement of the dam at Mendota Pool would have an overall benefit in the management of seasonal wetlands at MWA. The EA states that about 2,310 acres of seasonal wetlands could be benefitted by reducing the frequency and duration of lowering the Mendota Pool water levels during winter months for maintenance and dam safety inspections. While we do not question estimates in the EA about potential seasonal wetland benefits from application of firm Level 2 and Level 4 refuge water supplies at MWA, we do believe project-related benefits of firm delivery of both levels are somewhat less than identified in the EA. The benefits of providing Level 2 supplies, required by the CVPIA, should be identified in the No Action Alternative. For Level 2 refuge water supplies, only the increased certainty of providing these supplies should be included as a benefit of any alternative in the EA. While the new dam would assist certainty of providing Level 4 refuge water supplies to MWA, only this increased certainty should be included as a benefit of any alternative. Actual provision of firm Level 4 refuge water supplies would require outside-of-action acquisitions from willing sellers.

Wildlife

Construction activities could cause direct mortalities of ground dwelling amphibians, reptiles, and/or mammals through vehicle strikes or crushing of burrows, and removal of habitat for escape cover, foraging, and breeding. Construction activities occurring during the breeding season of these species or ground nesting bird-species would likely cause destruction of nests and

young. Elimination of habitat would also result in the loss of individuals. Animals that survive construction would be displaced; those that are able to move to adjacent areas may increase competition for limited resources in adjoining areas, with subsequent overall loss of individuals. Wildlife populations near the construction site can be expected to be impacted to the extent that their habitats are altered. In particular, the communities dependent on riparian habitats can be expected to be negatively impacted by any decrease in area and quality of riparian vegetation.

Table 1. Cover-types and acreage associated with construction of a new dam at Mendota Pool

Proposed Dam Site	
Cover-type	Acres Affected
Upland	0.20 acre
Riparian Woodland	2.55 acres
Riverine Aquatic	2.70 acres
Lacustrine Aquatic	5.50 acres[a]
Agricultural	5.00 acres[b]
Mendota WA	
Seasonal Wetland	2,310.00 acres[c]

[a]This cover-type would be created upstream of the new dam and downstream of the existing structure.

[b]Estimated area needed for construction and equipment staging area.

[c]Estimated area of wetlands benefitted as a result of providing both Level 2 and Level 4 refuge water supplies to MWA–combination of action alternative benefits and cumulative future benefits through section 3406(d)(3) and (b)(3).

Fish

This project would reduce the amount of riverine aquatic habitat by 2.7 acres and increase the amount of lacustrine aquatic habitat by 5.5 acres. Temporary effects to water quality in Mendota Pool would be expected during construction of the new dam. Best management practices would be implemented during construction to reduce water quality effects, such as increased sediment, during construction.

Threatened and Endangered Species

Reclamation will need to consult with the Service and CDFG to determine the effects of this project on Federal and State listed species.

MITIGATION

The recommendations provided herein for the protection of fish and wildlife resources are in accordance with the Service's Mitigation Policy as published in the Federal Register (46:15 January 23, 1981).

The Mitigation Policy provides Service personnel with guidance in making recommendations to protect or conserve fish and wildlife resources. The policy helps ensure consistent and effective Service recommendations, while allowing agencies and developers to anticipate Service recommendations and plan early for mitigation needs. The intent of the policy is to ensure protection and conservation of the most important and valuable fish and wildlife resources, while allowing reasonable and balanced use of the Nation's national resources.

Under the Mitigation Policy, resources are assigned to one of four distinct Resource Categories, each having a mitigation planning goal which is consistent with the fish and wildlife values involved. The Resource Categories cover a range of habitat values from those considered to be unique and irreplaceable to those believed to be much more common and of relatively lesser value to fish and wildlife. The Mitigation Policy does not apply to threatened and endangered species. Service recommendations for completed Federal projects or projects permitted or licensed prior to enactment of Service authorities, or Service recommendations related to the enhancement of fish and wildlife resources, however.

In applying the Mitigation policy during an impact assessment, the Service first identifies each specific habitat or cover-type that may be impacted by the project. Evaluation species which utilize each habitat or cover-type are then selected for Resource Category analysis. Selection of evaluation species can be based on several rationale, as follows: (1) species known to be sensitive to specific land- and water-use actions; (2) species that play a key role in nutrient cycling or energy flow; (3) species that utilize a common environmental resource; or (4) species that are associated with Important Resource Problems, such as anadromous fish and migratory birds, as designated by the Director or Regional Directors of the Service. (Note: Evaluation species used for Resource Category determination may or may not be the same evaluation species used in a HEP application, if one is conducted). Based on the relative importance of each specific habitat to its selected evaluation species, and the habitat's relative abundance, the appropriate Resource Category and associated mitigation planning goal are determined.

Mitigation planning goals range from "no loss of existing habitat value" (i.e., Resource Category 1) to "minimize loss of habitat value" (i.e., Resource Category 4). The planning goal of Resource Category 2 is "no net loss of in-kind habitat value"; to achieve this goal, any unavoidable losses would need to be replaced in-kind. "In-kind replacement" means providing or managing substitute resources to replace the habitat value of the resources lost, where such substitute resources are physically and biologically the same or closely approximate those lost.

In addition to mitigation planning goals based on habitat values, Region 1 of the Service, which includes California, has a mitigation goal of no net loss of acreage for wetland habitat. Freshwater emergent wetlands, and any other wetlands in the project area, are subject to this goal.

In recommending mitigation for adverse impacts to any of these habitats, the Service uses the same sequential mitigation steps recommended in the Council on Environmental Quality's regulations. These mitigation steps (in order of preference) are: avoidance, minimization, rectification measures, measures to reduce or eliminate impacts over time, and compensation measures.

Resource Categories

Riparian woodlands are of high value to both fish and wildlife species. Riparian woodlands provide cover, rearing and food resources for fish when the stand is large enough to overhang or protrude into the water Resident and migratory birds utilize these woodlands for feeding, resting, and nesting. Large stands of riparian high-value riparian woodland may have 10-50 breeding bird species. Because of its linear distribution and edge effect, the value of riparian areas to wildlife typically far exceeds the value of an equivalent acreage of non-riparian woody cover occurring in a single large block. We have chosen raptors as evaluation species because, as predators, they play a key role in community ecology of the study area; in addition, they have important human nonconsumptive benefits (e.g., birdwatching). We have placed project-area riparian woodlands in Resource Category 2, which has the associated mitigation planning goal of no net loss of in-kind habitat value or acreage.

The **uplands** in the project area provide habitat valuable for wildlife especially small mammals. Upland areas are typically located on, and adjacent existing levees and other non-agricultural areas along the San Joaquin River. We have chosen small mammals as evaluation species because of their importance to raptors, some reptiles, and larger mammals as prey species. Based on the relative abundance of uplands on a regional basis and its importance to small mammals, we have placed project-area uplands in Resource Category 3; our mitigation planning goal would be no net loss of habitat value while minimizing loss of in-kind habitat value.

Seasonal wetlands in the study area are of high value to numerous water- related birds. These wetlands are part of the Pacific Flyway and provide important resting and feeding areas for migratory waterfowl and shorebirds. Nearly one-half of the wintering ducks of the flyway utilize the Central Valley during mid-winter, and a significant portion of this use occurs within the San Joaquin Valley. As stated previously, the MWA supports about 2.6 million waterfowl use-days annually. Migratory waterfowl were chosen as evaluation species due to their importance to consumptive and nonconsumptive human activities (e.g. hunting, birdwatching) and Service Migratory Bird Treaty Act responsibilities. Seasonal wetland is scarce and continues to be lost on a national and regional basis. Thus, we have placed seasonal wetlands in the project area in

Resource Category 2, with the associated mitigation planning goal of no net loss of in-kind habitat value or acreage.

Riverine aquatic and **lacustrine aquatic** habitats are inhabited by resident fishes. The value of these habitats is variable and is influenced by factors such as water quantity and quality, substrate type, presence of bank and in-water cover, and bank type. These habitats are also valuable to wildlife. We have chosen native fishes, including warmwater gamefish, as evaluation species for these habitats because of their dependence on these habitats, and their importance to human recreation (sport fishing). These habitats, while still relatively common locally and regionally in the project area, are integral to the health of adjacent habitats, including riparian woodlands. Therefore, we have placed these habitats in Resource Category 2. The Service mitigation planning goal for Resource Category 2 is no net loss of in-kind habitat value or acreage.

The **agricultural lands** (cotton) in the project area are generally of low value to wildlife. We have chosen small mammals as evaluation species because of their importance as prey species. Agricultural lands are abundant in the project area with cotton being the dominant crop. Based on the abundance of agricultural lands and its low value for wildlife we have placed the in Resource Category 4, which has a mitigation planning goal of minimizing loss of habitat value.

The evaluation species, resource categories, and mitigation planning goal for the cover-types found in the project area are summarized in Table 2. These resource category determinations are provisional and subject to change.

Table 2. Evaluation Species, Resource Categories, and Mitigation Planning Goals for the Cover-Types in the Mendota Pool Dam Replacement Project Area.

COVER-TYPE	EVALUATION SPECIES	RESOURCE CATEGORY	MITIGATION GOAL
Seasonal wetland	migratory waterfowl	2	No net loss of acreage or in-kind habitat value
Riparian woodland	raptors	2	No net loss of acreage or in-kind habitat value
Upland	small mammals	3	No loss of habitat value while minimizing loss of in-kind habitat value
Riverine aquatic	warmwater gamefish and native fishes	2	No net loss of acreage or in-kind habitat value
Lacustrine aquatic	warmwater gamefish and native fishes	2	No net loss of acreage or in-kind habitat value
Agriculture	small mammals	4	Minimize loss of habitat value

DISCUSSION

The Service recognizes the benefits the proposed alternative would have on improving the reliability of water supply to MWA. Currently refuges, including MWA, must store larger amounts of water on their lands an average of 6 inches deeper, when the Mendota Pool is dewatered for dam safety inspections. This adversely affects dabbling ducks by increasing their energy expenditure to obtain food and in some instances creates areas too deep for feeding, and does not allow for water movement which increases the threat of avian diseases. With the project, the frequency of dam safety inspections would be reduced from every 2 to 3 years to once every 10 years. However, with the project, dewatering for canal maintenance would still occur every 4 years.

While recognizing the benefits, the Service has reservations to placing another hard point in the San Joaquin River, especially using Central Valley Improvement Act (CVPIA) Restoration funds. The San Joaquin River Settlement process is looking for ways to provide water for all current users of Mendota Dam. It also focuses on restoration of the San Joaquin River, including the area in and around Mendota Pool. We believe any decisions regarding the replacement of the Mendota Dam should consider and cite information provided by the San Joaquin River Settlement process.

Associated with your efforts to determine the best alternative to provide firm conveyance of refuge water supplies to MWA and our joint effort to implement the CVPIA, several concepts should be represented in the final EA. We believe the portion of the future condition resulting in conveyance of firmer Level 2 refuge water supplies, as provided for under section 3406(d)(1) of the CVPIA, could be attributable to the action to replace Mendota Pool dam. However, conveyance of a firm Level 4 refuge water supply, as provided under sections 3406(d)(2) and 3406(b)(3) of the CVPIA, requires willing sellers. An unidentified portion of this Level 4 supply would therefore require actions beyond alternatives defined in the EA. Based on these assumptions, we believe future conditions with the project would have fewer project-specific benefits at MWA than implied in the EA. We also believe the creation of a project-related action providing assurance of full Level 4 refuge water to MWA, at no additional cost to the Federal government in perpetuity, would dramatically increase any alternative benefits.

If a cost share process is to be established with other beneficiaries of the Mendota Pool dam replacement, then a better evaluation of all benefits from all alternatives should be completed. The EA does not currently provide sufficient discussion regarding the potential benefits to agricultural and possible municipal diverters using the Mendota Pool in the existing, no action and action alternative conditions. If replacement of the Mendota Pool dam allows for a firmer, more reliable water supply for diverters, what effect might this have on water reliability for the MWA? If firmer water supplies allow for the expansion of farming or municipal development, what effects might this have on the capability to acquire Level 4 refuge water supplies in the future? Because there are certain to be benefits for agricultural diverters, beyond the intuitive economic benefit of providing Federal funding to assist in replacement of a private dam of

questionable safety, the EA needs to more clearly explain agricultural and municipal benefits and impacts from each alternative. Establishment of equitable cost would better provide justification for use of Federal and other funding to partner in this effort. Additionally, as identified in section 3406(d)(3), the Federal cost-share for this effort is 75 percent nonreimbursable and 25 percent allocated to the State. Based on existing decisions and ongoing discussions with CVP water users, it is not clear which Federal funds may be used to partner in the replacement of Mendota Pool dam.

The EA implies project-related impacts are not significant and therefore would not need to be mitigated (page 4-18, section 4.3.2.3). We believe NEPA does not specifically instruct Federal agencies to avoid or limit mitigation if impacts are determined to be relatively minor or insignificant. Furthermore, because the area that would be impacted through replacement of the dam is an existing environmental mitigation site with mature riparian vegetation, we believe any resulting project should maintain the preexisting habitat values. In support, the attached CEQA Negative Declaration identifies that compensatory mitigation of the project-related impacts will be required (page 3).

RECOMMENDATIONS

In general, if a project is pursued, the Service recommends that Reclamation:

1. Reevaluate the alternative identification and selection process to assure that all possible reasonable alternatives have been included to meet the "Purpose and Need" as would be defined in the final NEPA/CEQA document.

2. Associated with this reevaluation, clearly and separately identify the benefits of any alternative in providing Level 2 and Level 4 refuge water supplies at MWA. Analyze the benefits of each alternative accordingly, including full disclosure of any benefits or impacts to environmental, agricultural and municipal water users.

3. Include and cite information from the San Joaquin River Settlement process in relation to the alternative analyses.

If the Preferred Alternative is determined to be the replacement of the existing Mendota Pool dam, the Service recommends that Reclamation:

4. Complete Section 7 consultation with the Service (and/or NMFS) as appropriate.

5. Complete consultation with CDFG as appropriate, regarding any potential impacts to State listed threatened or endangered species.

6. Design the replacement dam so that it contains provisions for both up- and down-stream anadromous fish passage.

7. Compensate for the loss of 2.55 acres of riparian forest and 0.20 acre of upland by creating 2.77 acres of riparian forest and 1.20 acres of upland..

8. Negotiate with the exchange contractors so that costs for replacement of the existing Mendota Pool dam will be shared on a "beneficiary pays" basis. A percentage of project-related construction and mitigation costs would be shared by all beneficiaries, predicated on the percentage of benefit provided by the action, and that the nonreimbursable Federal share should be 75 percent. This would require a more accurate evaluation of benefits for all Mendota Pool water users.

9. Seek to negotiate perpetual provision of all or a portion of Level 4 refuge water supplies for the MWA be included in the Preferred Alternative and occur at no additional cost to the Federal government.

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